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ABSTRACT

In compiling the final report of Wisconsin's ERIC on-line Information Retrieval Demonstration and Research Project, an extensive review of research on information science, user needs and perceptions, and information use and saturation was seen as a vital first step. Such knowledge might help explain the successes and failures of the Project, which placed display terminals linked to the ERIC data base in four districts and provided training in use of the systems for district personnel. Numerous successful searches were conducted for users, though breakdowns in the new computer program caused some dissatisfaction. Improved service could result from acceptance of the linker/gatekeeper model in information dissemination. Standard data such as costs, description of services, user documentation, forms, and reports have been collected in appendixes. (LS)

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WISCONSIN'S ERIC ON-LINE INFORMATION RETRIEVAL - DEMONSTRATION AND RESEARCH

FINAL REPORT, JUNE 1975

Center for Studies in Vocational & Technical Education

University of Wisconsin-Madison

IR 002 528

FINAL REPORT

Project No.
19-031-151-225

WISCONSIN'S E R I C ON-LINE INFORMATION RETRIEVAL - DEMONSTRATION AND RESEARCH

(Information Retrieval Demonstration and Research Project)

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The Center for Studies in Vocational and Technical Education
University of Wisconsin - Madison

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We would also like to express our gratitude and praise to Richard Schwartz, who successfully launched the project in 1973, laundered its blemishes, passed on his insights, and left us with having made an excellent contribution.

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PREFACE

The following report of the Information Retrieval Demonstration and Research Project is an attempt to bridge the gap between two parts of the ERIC data base, Research in Education and Current Index to Journals in Education. We could not submit an accounting of our project in education research without a demonstration of all facets of the problem of information dissemination and utilization. Therefore, less attention has been paid to providing the reader with a cookbook of our progress than a review of research we found necessary to help us identify some glaring deficiencies in our project design and of a few others we modelled ours after. Because we have chosen this approach, the reader will find little development in what is typically the most extensively written section of other research reports, and he will find no columns of statistical figures which attempt to serve as authenticator of our work. We have attempted a mammoth task, and we discovered how much so when we looked into the background of other studies relating to our efforts. We forged ahead, as we must, and we present here an honest appraisal of what we could and could not do. Most of the bulk fills the introduction and the conclusions and recommendations. We are, of course, responsibly and gratefully indebted to other authors whose work we have synthesized into our own and without whose insights we would still be sitting at our desks scratching our heads and wondering if we had spent the past two years doing anything worthwhile at all.

The authors have decided that probably what is needed more right now is a comprehensively compiled review of the literature on information, its retrieval, its dissemination, and misconceptions about it. We produce this, then, by combining a long introduction with a long conclusion and recommendation, leaving little in findings and other parts of this paper.

Readers who are interested in the first year's study should consult ERIC under the subtitle, Information Retrieval Demonstration and Research Project. For this years extension of last year's efforts, the reader may wish to go directly to page eighteen where the Scope of the Study begins, and proceed to the bottom of page twenty where our conclusions and recommendations continue what we actually learned we needed to do. A review of the Appendices to this report will then help the reader understand more about how we did it, the nuts and bolts skeleton we chose to avoid in the body of the report.

INTRODUCTION

ABSTRACT

By making use of an unconventional approach to final reports for projects of this kind, the authors have appended the information utilization and dissemination literature by providing a selective review of it. The long introduction discusses the kinds of information they have considered by preceding the rest of the report with three information taxonomies. From these lists they draw up notions of what information the information user wants or needs, and then procede to disallow certain conventional approaches to assessing the needs of a user group. Although needs assessments are necessary for any information base dissemination, needs must be identified strategically rather than tactically, keeping in mind that information users cannot make use of information unless they get what they are looking for; that is, they must perceive it to be useful, and they must be willing to accept it. Information is a concept advanced as having a "degree of fit" to the user's understanding and acceptance of it as useful. Reference is made to futures planning, with comments from Alvin Toffler and Lewis Mumford. And information "saturation" is considered as a reason why users are resistant to accept further data, as wit today we see anything associated with politics, including the reporters who tell us about it, as sordid and dishonest. ERIC is criticized for being much too immature despite the passing of years, and suggestions are made which might begin to change ERIC and libraries in general for the better. Brief suggestions, perhaps too brief, are made as to steps necessary for disseminating or diffusing information, but included here are the important concepts of the "linker" and the "gatekeeper." A four-page bibliography is included which appraises some of the sources used within the report, and several appendices show data which describes some features of the demonstration project.

Use of Information

It is not possible in any very comprehensive way to discuss information retrieval or information dissemination without attending first to the broader notion of what information is and how it is used. For our purposes, while we submit that information takes many forms other than what we specify, we are still going to delimit the definition of information to what can be reproduced on a piece of paper or delivered in an envelope or over the telephone. Therefore, information is defined as a collection of source data which is sought by a user for the purpose of assisting him in the managing of decision-making functions.

There are other useful descriptions of what information is, and because it is not our design to set in stone any venerable new household terms with our definition, we present some of them. One we find particularly arresting is that given us by Tykociner.[1] It relates the affinity of information for knowledge. Though there need be no causal connection between knowledge and information, there is a similarity in their lending themselves to useful situations for some purpose. In the zetetic system, there are twelve areas of knowledge:

The Arts
Symbolics of Information, e.g., mathematics, linguistics[2]
Hylenergetics, e.g., physics, chemistry, astronomy
Biological Sciences
Psychological Sciences
Sociological Sciences
Exeligmology, or sciences concerned with the past
Pronoetics, or sciences concerned with providing for the future, e.g., agriculture, medicine, technology
Regulative Sciences, e.g., jurisprudence, economics, management
Disseminative Sciences, e.g., education, journalism, vocational guidance
Zetetic Sciences, e.g., problematology, taxology, general methodology
Integrative Sciences, e.g., philosophical sciences, aspirational sciences, general systems

This is a nicely ordered system of taxonomic adroitness, representing in discrete categories the orders and relationships of one to another, and distinguished from each other by the characteristics and research methods of that form of knowledge. But it has an even more significant use in its ability to single out new sciences by forming intersecting links between two or more of those listed. Short identifies the appearance of anthropology in the intersection of sociology and exeligmology, and delivers to us a new science of prognostics by the crossing of exeligmology and pronoetics. It

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[1]Tykociner, J. T. "Zetetics and areas of knowledge." In S. Elam (Ed.), Education and the Structure of Knowledge. Chicago: Rand McNally, 1964, pages 121-147 and in Tykociner, J. T. Outline of Zetetics: A Study of Research and Artistic Activity. Urbana, Illinois: Engineering Publications Office, U. of Illinois, 1966.

[2]Short, Edmund C., Review of Educational Research 43 (3), 287-301.

excites us to think that perhaps the mysteries of genetics might be unveiled by scientists dedicated to ontogenetics formed by the decussation of the biological sciences with zetetics or the integrative sciences and thereby uncovering the disposition of certain genotypes to cancer and promoting the identification of that anxiously-awaited discovery of its cause(s).

Another useful categorization of information *qua* knowledge is given to us by Znanieki.[3] Here the taxonomic structure is fashioned after the roles of those whose work with knowledge each category represents, to wit:

Explorers of Knowledge, e.g., inductive theorists
Discoverers of Facts
Educators
Systematizers
Popularizers
Historians of Knowledge
Fighters for Truth
Contributors
Discoverers of Extended Truths
Sages
Technological Experts
Technological Leaders

While it seems to these writers that there is more room for confusion in assigning these roles to an individual of some particular productive capability, it may be that we are simply more enchanted with the new words Tykociner provides. Yet, though the junior author is an education research specialist and the senior author is associate director of our research center, we think we might place ourselves in several of these categories. That is, we feel there is a "degree of fit" for us in more than one of the taxonomic labels. We are assuming that Znanieki's classes are not hierarchical.

A last classification scheme is that of Paisley,[4] which resembles Znanieki's in design in that it is forged around the role of the scientist. This is another particularly useful scheme because it predicates the understanding and the evaluation of a form of knowledge on the function of the scientist within the field in which he generates knowledge. Thus one is led to assume that the instruments of one science cannot be used to evaluate another science of a different order because the tools for one would not be appropriate for another. In this scheme there are ten systems in which the scientist plies his knowledge:

His culture
His political system
The legal/economic system
A formal information system (library journals)
His professional membership group

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[3]Znanieki, F. The Social Role of the Man of Knowledge. New York: Columbia University Press, 1940.

[4]Paisley, W. J. *Perspectives on the Utilization of Knowledge*. Address to the Annual Meeting of the AERA, Los Angeles, 1969.

His formal work organization
His reference group (shared research specialty)
His preferred colleague group (invisible college)
His immediate work associates
His own head (personal cognitive structure)

Now to apply all this to the topic at hand, the information user, Edmund Short informs us: "A knowledge producer may have certain questions to investigate, certain methods of research that can be applied, but if the nature of the knowledge he seeks is not clear to him (meaning that it is not categorized or relateable to other knowledge available to him) it may be most difficult to theorize about or to formulate in terms that communicate."[5]

Relating back momentarily to these classification schemes and evaluation, it becomes apparent that education is a field where it is common custom to take the tools of one science and apply them to the educative task. In this way we have taken a tool of Tykociner's integrative science (where I place commerce and business), accounting, and used it broadly and with little if any definition in a disseminative science (education) as accountability. (It is not true that there is a similarity in name alone to accounting and accountability, and for proof of this one should refer to the historical writings of Herbert M. Kliebard, University of Wisconsin-Madison.) Short would and does avow this same point, and explains as I have that, "...selection of methods of knowledge verification or of criteria for testing knowledge claims must be appropriate to the kind of knowledge being derived [so that it will be] fully and clearly apparent to the researcher [for] his choice to be a fitting one."[6] While Short refers to a process performed by the producer of knowledge as distinct from the consumer of knowledge, the point is universally applicable. We think of the practitioners at the local level, the teacher, the principal, and the administrator as the consumers of knowledge.

That any of what we have said so far has any bearing to the use of information as we were prepared to present it in our computerized bibliographic form is supported by the following. In the making of decisions to use information, from a computerized or any other source, the user determines what uses he has for what he will find. In other words, he sets a kind of goal to be achieved. The optimal program of setting goals assumes that, given clear preferences and complete knowledge, Martin Shubik tells us, rational behavior amounts to following a consistent plan of action toward those goals. This is a widespread planning procedure for millions of Americans. We decide what kind of work we would like to do, for instance, and then we go to school to be trained or follow an apprenticeship until we are advanced to where we set out to go. While the process is rarely this straightforward and simple in practice, it is the plan of attack we customarily follow with some religious fervor.

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[5]Short, Edmund C. "Knowledge Production and Utilization in Curriculum" Review of Educational Research 43(3), 237-301 (Se 1973)

[6]Ibid., p. 252.

What prevents us from reaching the place we set out for, and so disrupts the process of using information appropriate to that process, are two unfortunate facts of life which Shubik calls to our attention. "The first concerns man as an information processor and the second the conflict of individual with group preferences."[7] He explains: "...man lives in an environment about which his information is highly incomplete. Not only does he not know how to evaluate many of the alternatives facing him, he is not aware of a considerable percentage of them."[8] And, "...as the speed of transmission of stimuli increase, the limitations of the individual become more marked relative to society as a whole."[9]

What of the conflict of the individual with the society as a whole?

> ...Given the preferences of all, market mechanisms and voting procedures will only succeed if very special conditions prevail... It is necessary to consider that the preferences of the individual are either completely independent of the welfare of others or subject to very strict limitations (such as being identical). Furthermore, the conditions go against intensive specialization, as many individuals are needed in all walks of life in order to avoid the dangers of monopolization.[10]

Thus, while specialization is what is often required in order to perform some work responsibility, we are averted from getting there by some unforeseeable intervention. Our point is, this is an obvious upset in the selection of or use of information. And it happens in most cases every day, making the information-seeking process difficult, spontaneous, and often unplanned sufficiently.

All of which interferes measurably with planning an information center available to a wide variety of consumers, we submit. For the simple providing of access to information guarantees nothing about how much it will be used, how often, or how effectively. How come? Because, for one thing, this intervention of forces with our goal-seeking methods, lack of understanding of what forms of knowledge we are looking for, or where we might find it plays upon our preferences for the information we trust.

John McNelly is one who understands this phase of our discussion well. Some information is of a kind that also intervenes with what we believe is necessary for achieving our goals. The strongest of us doggedly pursue our goals despite setbacks, but each setback distorts what we perceive as useful information. McNelly explains:

> The information a person receives or perceives provides the basis for his or her beliefs. Beliefs can be conceptualized

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[7]Shubik, Martin. "Information, Rationality, and Free Choice in a Future Democratic Society." Daedalus 96(3), 771-778 (Summer 1967).

[8]Ibid., p. 772.

[9]Ibid.

[10]Ibid., p. 774.

> as judgments about information, or even as inferences about cause and effect.
>
> These beliefs may become related, one to another, in the mind to form a structure. The structure or arrangement of beliefs can be said to constitute an attitude--following Rokeach's definition[11] of an attitude as 'an enduring organization of several beliefs focused on a specific object (physical or social, concrete or abstract) or situation, predisposing one to respond in some preferential manner.'
>
> This predisposition to respond, of course, may or may not result in a specified behavior. That, as social scientists so often discover, depends upon additional factors that may be impossible to predict or control.[12]

Another author who diagnoses the situation changing as intervening factors interfere with our decision-making measures is M. Brewster Smith. He declares outrightly that while our attitudes may be stable our ability to assess information in an atmosphere of continual change varies with our beliefs.

> Of all the results of communication research, the central finding that ought to be kept before all would-be communicators is the fact of resistance. In general, people's beliefs, attitudes, and behavior tend to be stable. Demands and arguments for change, uncomfortable new facts that do not fit neatly into accustomed categories, are likely to be resisted. Whenever communications attempt to change preexisting beliefs, attitudes, and habits that engage important goals and values, strong resistances are likely to arise at each stage of the communication process. Thus some communications are so strongly resisted that they fail to achieve even the first step of eliciting audience exposure to the message...[13]

It does not seem surprising to us, in recognition of these circumstances and their seemingly plausible explanations, that most information *qua* communications systems are going to run up against a rampart of resistance in their adoption. For the discovery of contrary evidence to what one has always believed, if tied closely enough with values and beliefs, will be ignored as so much extraneous data. And if one makes efficient use of an information system he is going to run across evidence that is contrary to his beliefs. The practiced empiricist will weigh the new evidence and assess it in comparison to what he knows and form some conclusion which embraces all the available facts. The ordinary person, when called upon

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[11] Rokeach, Milton. "The Role of Values in Public Opinion Research." Public Opinion Quarterly 32, pages 537-559. Winter 1968-69.

[12] McNelly, John T. "Mass Media and Information Redistribution." The Journal of Environmental Education 5(1), 31-36. Fall 1973.

[13] Smith, M. Brewster. "Motivation, Communications Research, and Family Planning." In Wilbur Schramm and Donald F. Roberts (Eds.) The Process and Effects of Communication, rev. ed. Urbana, Illinois: Illinois University Press, 1971, p. 827.

to conscionably mull over all this information, will dismiss what he cannot fathom and revert to what he knows. And who will wag the finger at him? Who will cast the first stone?

In performing an evaluation of information systems, one must regard each of the above circumstances and many others listed below in order to have a full understanding of its outcome. Robinson refers to the insight of Godson in her comments which are criteria Godson suggests for evaluation programs:

1. Positive changes in individual behavior and attitudes toward innovation and change;
2. Developing a climate conducive to innovation and change;
3. Positive change in innovativeness of a school system; and
4. The system's ability to be self-starting or self-renewing.[14]

We feel this evaluation model would be exploitable with little modification in appraising use of information and designing information dissemination systems.

User Needs

While the assessment of user needs would have the appearance of being the most logical and straightforward approach to designing an information system, there is a hidden caveat to this pathway. It has been tried and appraised by several researchers, a few who are cited here: (Benson, Gregory M. Jr. *Dissemination as a Process Component with Implications for Organizing a State Agency Dissemination Unit.* Albany, New York: New York State Education Department, Educational Programs and Studies Information Service. De 1972; McCracken, J. David and Wilma B. Gillespie. *Information Needs of Local Administrators of Vocational Education. Final Report.* Center for Studies in Vocational and Technical Education. Columbus, Ohio: Ohio State University. Ma 1973; Paisley, William J. "Information Needs and Uses." In *Annual Review of Information Science and Technology. Volume III.* Carlos A. Cuadra (Ed.) Chicago: Encyclopedia Britannica, pp. 1-30, 1968; and Magisos, Joel H. *Interpretation of Target Audience Needs in the Design of Information Dissemination Systems for Vocational and Technical Education.* Columbus, Ohio: Center for Studies in Vocational and Technical Education; Ohio State University. 1971)

Throughout all these appraisals there is a common theme: that information needs are something unique within themselves and are accessible with some effort. That is, they are concrete and may be attacked with tactical approaches. It turns out that this is probably not the case at

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[14]Robinson, Erika L. *An Analysis of the Impact of the Research Utilization Project on Principals' Attitudes and on the Use of Information Services by Teachers and Other Field Personnel in 16 Target Elementary Schools of the District of Columbia.* Washington, D. C.: District of Columbia Public Schools, Department of Research and Evaluation. Ag 1973, p. 9.

all. Instead, as Deats points out, there are some erroneous assumptions in this approach. One is the generally-held belief "that the failure of many educators to use much of the current educational research data is a communication problem which can be solved through tactical procedures such as repackaging messages in different media."[15]

Deats elaborates on this notion of a difference between tactical and strategic levels of decision-making as generic opposites. The strategic level takes a look at what a communication system is and how it is working, what he calls the "conceptual-evaluative orientation." The tactical level explores the skills and techniques of operating a dissemination system, the "developmental and utilitarian orientation."[16] So, he is saying that assessing needs at the first level of operation, the tactical level, is all wrong. The tactical level is concerned only with "operationalizing the strategic ways of seeing," which means that the strategic level is the "ways and means of seeing the world."[17] Here we return to the notion that a person's view of the world is colored by his impression of it, that information divergent from his conceptual structure alters his ways and means of seeing the world.

There is a broader scope to be considered, then, than just what information needs users have. One must also consider their orientation to the information they will use. Donald Ely has stated it concisely.

> Both education and information agencies commonly purport to meet the needs of users. However, the analysis of needs is fraught with ambiguity whether we are dealing with education or information. Five such myths are explored in this paper. Information is here considered as that which reduces uncertainty. It may exist as data in books, computers, people, files, and thousands of other sources, but these sources are simply raw data until they are used by someone to achieve a specific purpose.[18]

One of the notions Ely calls a misconception is what we have been discussing: "information needs can be easily identified."[19]

> Of the many studies that have attempted to identify user information needs, none has probed sufficiently to yield anything more than statements of 'nice to know' information and information seeking behaviors...The issue here is methodological. How can we determine the information needs of an individual if indeed they can be articulated? A series of protocols may be posited,

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[15]Deats, Tom. "Moving and Using Information." Teacher's College Record 75(3), 383-393, Fe 1974.

[16]Ibid., p. 388.

[17]Ibid.

[18]Ely, Donald P. "The Myths of Information Needs." Educational Researcher 2(4), 15-17, Ap 1973. Mr. Ely is from the Center for the Study of Information and Education, Syracruse University, New York.

[19]Ibid., p. 15.

> each of which might be expected to yield statements of need closer to the 'truth' as one moves from relatively impersonal approaches to more personal probing.[20]

Typically, the studies that have been done yield information which is "probably colored by salient needs at the time of response, the limitations of choice on the questionnaire, and perceived access to information that would fulfill the need."[21] While the suggestion that the issue of determining user needs is methodological seems contrary to what we mentioned espousing earlier by Deats, we feel that Ely is simply identifying what evaluators have tried in the past, as is suggested by his summation that studies which have been done were colored by the empirical controls they employed. Our view is that while 'needs' studies have formerly been methodological in purpose, future 'needs' studies must employ a phenomenological intent.

Another interesting appraisal conducted by Ely is that "given sufficient information, decisions can be made."[22] This is another misconception, he says.

> The quantity of information available in many fields is exceeding the capacity of the individual to evaluate its usefulness...There is a wide range among users in the quantity of information needed or consumed. This variability is related to motivations, capacity, the nature of tasks, and other factors. Sufficiency does not seem to be the single critical factor in acceptance of information. The variables of quantity, communicator credibility, format, perceived need, and timing interact simultaneously to confound the issue.[23]

A third misconception which Ely identifies is that "information and education are unrelated."[24] This relates to a problem which is twofold. First, Ely says that the "relationship between information and education can be inferred from John Gardner's[25] statement that, "The ultimate goal of the educational system is to shift to the individual the burden of pursuing his own education."[26] As Paisley and Parker put it, "It is part of our educational tradition to wean a child from dependence on source-controlled communication and to expect of him ever greater self-responsibility in his choice of communication sources, forms and methods."[27] To Paisley and Parker, the receiver-controlled system is one in which

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[20]Ibid.

[21]Ibid.

[22]Ibid., p. 16.

[23]Ibid.

[24]Ibid.

[25]Gardner, J. N. Self-Renewal. New York: Harper and Row, 1963.

[26]Ely, op cit.

[27]Paisley, W. J. and E. B. Parker. *Information Retrieval as a Receiver-Controlled Communication System.* In L. B. Heilprin et al. Education for Information Science. London: Macmillan. 1965).

"the receiver selects the messages he chooses to receive or the form in which he chooses to receive them."[28] But the source-controlled system is that in which "the choice of message content and form, the choice of audience, and the choice of time and method of transmission are all prerogatives of the source...But [he interjects] the locus of control is no longer a useful way to distinguish between instruction and information transfer."[29] For as source-controlled systems move closer to the principle of receiver-controlled systems, they will adopt the inductive quality of the latter, the ratiocinative process of teaching and learning become one. In a practical way, this means that source-controlled systems, like libraries and information systems, will develop more individual-oriented means for dissemination of information. And in this way, as the user is able to make more individual use of information (like getting it in his own home on his television set, or on paper he can read in bed instead of on microfiche he has to use at a reader) he will be able and likely to initiate more of his own information searches. Thus the library will have become, in this simplified illustration, a sort of receiver-controlled system. And the information-gathering process will become an educative process, rendering the receiver/source control to one in which the locus of control is in the hands of the user.

The need for information systems at all becomes apparent in a second facet of what is really a different problem altogether. In this problem the receiver is now called the seeker of information; the source is the originator, the generator of information as knowledge. There is not a workable model for seekers to be able to pursue the generators of information, nor does it seem feasible for the generator to have to communicate or disseminate his findings. "There is strong evidence [that] the researcher is not equipped as a 'disseminator.' The generator of knowledge in the field of education may be interested in having his findings utilized and may help develop a plan whereby his specific findings or products are disseminated to a target group or groups. This kind of dissemination activity fulfills part of the objectives and mission of the researcher or developer. The information dissemination system *differs* from this kind of activity in that it provides the user with alternative concepts and/or related findings or products."[30] We expect that there will be ever greater demands for information systems, but the demands will change the way such systems are being offered now by making systems comply directly with user needs instead of in the present source-controlled fashion. Users will simply not make use of information systems that cannot meet all of their requirements for facility and heteromorphic presentation.

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[28]Ely, op. cit., p. 16.

[29]Ibid., p. 17.

[30]Taylor, Celianna I. and Joel H. Magisos. *Guide for State Vocational-Technical Education Information Dissemination Systems*. Columbus, Ohio: Center for Studies in Vocational and Technical Education, Ohio State University. 1971.

Information Saturation

We borrow here from a term in chemistry, saturation. In this science the term saturation does not mean simply filled, it means filled to complete capacity. What we intend to discuss is the information explosion, the condition of modern technological societies wherein information is available as a plethoric congestion for individual involvement. Alvin Toffler has called the same phenomenon information overload. It seems worthwhile to begin with his description. In several interviews he uncovers the following responses in academia:

> "You can't possibly keep in touch with all you want to," complains Dr. Rudolph Stohler, a zoologist at the University of California at Berkeley. "I spend 25 per cent to 50 per cent of my time trying to keep up with what's going on," says Dr. I. E. Wallen, chief of oceanography at the Smithsonian Institution in Washington. Dr. Emilio Segre, a Nobel prizewinner in physics, declares: "On K-mesons alone, to wade through all the papers is an impossibility." And another oceanographer, Dr. Arthur Stump, admits: "I don't really know the answer unless we declare a moratorium on publications for ten years.
>
> New knowledge either extends or outmodes the old. In either case it compels those for whom it is relevant to reorganize their store of images. It forces them to relearn today what they thought they knew yesterday. Thus Lord James, vice-chancellor of the University of York, says, "I took my first degree in chemistry at Oxford in 1931." Looking at the questions asked in chemistry exams at Oxford today, he continues, "I realize that not only can I not do them, but that I never could have done them, since at least two-thirds of the questions involve knowledge that simply did not exist when I graduated."[31]

Another "expert" cited by Toffler relates the following:

> At the rate at which knowledge is growing, by the time the child born today graduates from college, the amount of knowledge in the world will be four times as great. By the time that same child is fifty years old, it will be thirty-two times as great, and 97 percent of everything known in the world will have been learned since the time he was born.

There is a distinct point, you see, whether it is psychological or physiological, mental, psychic, or created, at which information we attempt to process becomes more than we can handle. Some researchers we will mention later call the limit to which we can efficiently assimilate information in our heads "channel capacity." But it need not be a limit

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[31]Toffler, Alvin. Future Shock. New York: Random House, p. 157, 1970.

that is reached by only seeking information; it is a limit which is an everyday occurrence for some people.

> Managers, plagued by demands for rapid, incessant and complex decisions; pupils deluged with facts and hit with repeated tests; housewives confronted with squalling children, jangling telephones, broken washing machines, the wail of rock and roll from the teenager's living room and the whine of the television in the parlor--may well find their ability to think and act clearly impaired by the waves of information crashing into their senses.[32]

This has important implications for information dissemination agencies, for they look to the harassed manager, teacher, or administrator like insensible purveyors of useless information designed especially for eggheads and other goofballs of that ilk. It becomes inconceivable to anyone who is either self-inclined or compelled to function near their channel capacity that more information is needed. As reviewed by Douglass Cater, this continual assault with information leads us to distrust the sources we use or might otherwise trust to use even though we have not used them so far. There is a point where information saturation causes us to recoil from a bombardment which we do not wish to suffer because we cannot understand it.

Professor Michael Robinson, a political scientist mentioned by Cater, notes that those who spend alot of time simply watching whatever comes on their television screens are bombarded with news about politics. And most of what they see is of a negative character, which leads them to believe that all political gambits are serpentine and devious. This is a kind of unnatural dependency on the television as a main source of information, but the situation is not uncommon. "The more dependent someone becomes upon television as his principle source of information, the more likely he is to feel he cannot understand or affect the political process."[33] One can see what a danger it is to tolerate a large population of people believing that the very life blood of their government is mired in scandals and demagoguery in the conduct of official matters of state. The puffery promoting much of merit in affairs of the nation is stained by rancor amongst these folk, and the sordid cries of anarchists fall on turned ears instead of informed and deaf ears. The place for information is clearly here. The question remains simply how to disseminate it and promote it.

We cannot ignore the unmeasurable contribution of the mind to the ordering of the universe. We must pay attention to the way each individual "fits" his idea of the real into his expression of the way he lives, not bombard him with information which he is not prepared to accept. Lewis Mumford tries to tell us how important it is to pay attention to the way the mind sorts out information. For mind is what gives meaning to everything we know.

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[32]Toffler, op cit., p. 353.

[33]Cater, Douglass. "The Intellectual in Videoland." Saturday Review, May 31, 1975.

> As with the sequence of time-keeping inventions, neither an external creator nor a predetermined plan is needed in order to account for the increase of organized creativity and self-actualizing design. The total result of this process is a beautiful and unimaginable surprise: 'If God knew the answer he would not bother to work it out.' Yet at the very heart of the hydrogen atom the physicist confronts the fact that its behavior pattern cannot be accounted for except by invoking an invisible agent that we recognize only in its human form: namely, mind. The specific nature of the elements, themselves seemingly evolving out of the primordial charges dynamically held together in the hydrogen atom, defy any mode of explanation except in the equally inexplicable terms of mind itself. Between that Alpha and Omega, the beginning and the end, lies the mystery of life. Destroy the undefinable subjective component, and the whole cosmic process, like the process of time-keeping, becomes meaningless--indeed unimaginable.[34]

In the design of information dissemination systems, we cannot ignore that undefinable subjective component, the mind, which gives meaning to life. While life might continue, unhindered and perhaps untampered with, without the intrusion of mind, it would be meaningless and unimaginable for intelligent cohabitation. Mumford continues:

> Machines, however crude, are embodiments of a clearly articulated purpose, so firmly fixed in advance, both with respect to the past and the future, that even the lowest organism, if similarly organized, would be unable to utilize fresh genetic mutations or meet novel situations.

Mind, fixed in advance only in purpose, treats novel and knotted situations with precognition and determination, and suffers from almost none of the machines failings save perhaps some maximal computing capacity and the specially humanly unique responsibility of emotive intricacy.

> ...I propose to examine the actual nature of the machine--any machine--to see if it can be adequately described and understood by the purely analytical method in the restricted terms that have been applied to animate organisms.
>
> If it cannot be so described, then the reference to this model in interpreting organic behavior conspicuously misses the one significant trait that actually binds mechanisms and organisms together--purposeful organization and subjective intention.
>
> For convenience let us follow Galileo's frequent practice, that of making a hypothetical experiment. Take a clock that has 'fallen from the sky,' and let us suppose that the history of time-keeping and the function of a clock are as completely unknown as the origins and functions of living organisms were four centuries ago. Let this strange instrument (the clock) be

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[34]Mumford, Lewis. The Myth of the Machine. New York: Harcourt Brace Jovanovich, Inc., p. 90, 1970.

passed around a group of diverse specialists, with each one extracting a single part: the glass, the face, the hands, the springs, the wheels and ratchets, and so forth, until the clock is completely dismantled. Then let each part be accurately measured, photographed, and analyzed by qualified physicists, chemists, metallurgists, mechanics, each working (separately) in his private laboratory. When their reports are assembled, each part currently open to scientific investigation will be accurately known in 'objective' reductionist terms. In making such an analysis, the principle of causality will suffice unless the investigators penetrate to the core of the various atoms.

But meanwhile, the clock itself has disappeared. With this disappearance, the design that held the parts together has vanished, along with any visible clue to the function each part performs, how the assembled mechanism interlocks, and for what purpose the clock once existed.

...The design of the clock, and the functions performed by its parts can be taken in only when the clock is considered as a dynamic working whole. A purely causal analysis of the individual components would throw no light on the purposeful nature of the going mechanism. Though conceivably a re-assemblage of the parts might be achieved by a series of miraculous strokes without a subjective knowledge of its ultimate purpose--time telling--the dead mechanism would remain mysterious, and its purpose baffling. Even the twelve numbers on the dial would mean nothing in a culture that had never divided the day into twice twelve hours. So if by lucky accident and shrewd experiment the parts of the clock could be put together, the movement of the hands would still be unintelligible and the need for regulating the speed of the movement in conformity to a planetary time-keeper would never occur. Causal analysis, by definition, has no concern with final ends or human purposes.

What, then, becomes of the attempt at causal (non-teleological) explanation of living organisms through 'mechanism?' Plainly the working of the clock cannot be accounted for without reintroducing those human factors the scientific method has resolutely eliminated: astronomers and time measurement and time-oriented activities, as well as mechanics and clockmakers. In other words, the mechanical metaphor is not in itself a satisfactory device for eliminating purely human concerns, for mechanisms are themselves subjectively conditioned fabrications and their own peculiarities, which counterfeit certain aspects of organisms, are precisely what must be explained. Taken by themselves, machines represent a puzzle (the dismantled and misunderstood clock), not an explanation. The answer to that puzzle lies in the nature of man.[35]

User Responses and Activities

With information available, and assuming some level of promotion of information services, what can users do or do they do to seek information, and is what they do sufficient for their needs? We know from our

[35]Ibid., pp. 88-89.

experience that users are not making as much use as they could of information which is largely available. And we have in all the foregoing some understanding of why they do not. That information is available does not necessarily mean it will be used. Joel Magisos at the Ohio Center for Studies in Vocational Education notes that "users are not taking complete advantage of what is available" and makes as one of his principal recommendations that "local information sources be more thoroughly developed and that user education be accelerated."[36]

That user education is part of a very necessary program of dissemination activities is generally accepted. This falls under the heading of promotion of services, which we will discuss later. Magisos notes that "...We have had frequent indications that would-be users of ERIC (Educational Resources Information Center) and other systems become discouraged in their first attempts to find information. Typically these users are intelligent enough to master the system on their own. They simply will not take the time to learn the system when they are seeking information and have no reason to do so at other times."[37] We empathize sincerely with Magisos' frustrations that users will not use the system because they will not take the time to sit down and learn how it is set up to operate. But we think perhaps there is the additional difficulty not sought or discovered in his paper and that is that ERIC is still almost exclusively a *source-controlled system.*

This means that in order for users to employ the ERIC system in their information quest they will have to deal with someone else who is a trained user, and usually someone who they do not know. Since it falls a little contrary for most people to ask for patronage from a stranger, even though that stranger might be an information specialist or librarian whose occupation is providing assistance, it does not seem surprising that users do not learn how to use ERIC. In light of what we have discussed earlier, we feel that as ERIC grows from its still near-infancy it will become a receiver-controlled system which is usable by everyone. Indeed, it is the computerization of ERIC which substantially guarantees its eventual maturity since sophistication of computer programming will make available simpler processors to use. With simplicity and receiver control as principal features of the ERIC system, it will have enticement as its promoter instead of bewitchery, and more widespread understanding and use of ERIC will follow eventually. This combined with strategic instead of tactical promotion of ERIC will be its best guarantors of success.

Magisos has noted further that:

> Researchers have been reluctant to get involved in information dissemination systems. It requires a continuing management

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[36]Magisos, Joel H. *Problems Associated With Developing State Vocational-Technical Education Dissemination Systems.* A Paper Presented to the Annual Convention of the Association for Educational Communication and Technology at Minneapolis, Ap. 16-22, 1972, p. 3.

[37]Ibid., p. 4.

> commitment and special skills. Educational practitioners also are reluctant to get involved because they are suspicious of research and have come to rely on personal sources of information, however inadequate. Both groups need better information and both are enthusiastic about the potential for obtaining up-to-date reports inherent in the system once they've successfully used it.[38]

We assume the management commitment he mentions is the management of ERIC or other sources by information dissemination managers, and, that being the case, we agree that such commitments are peremptory goals. It is the special skills involved that makes the ERIC system such a difficult one to disseminate.

The junior author of this paper knows friends who are college graduates who still don't know how to use a thesaurus. If one were to pick up Webster's Thesaurus he would find it similar in layout to a dictionary, but with no definitions. However, the novitiate to Roget's would have to spend some time figuring out the cross-referencing before he could make even modest use of it. Most people still don't know how to use the cross referencing function of a dictionary, although at least a few of those would know where to look to find out. Is it any wonder, then, that the rotated descriptor display and the meaning of "scope note" in the ERIC system precludes its effective use? To answer how much this interferes with the use of ERIC and other systems, McCracken and Gillespie advise that "...research should determine how various target audiences perceive the usefulness of information products, while evaluative studies of a system should determine how they might more nearly meet user needs."[39] We echo these directions and add that the survey be done in person rather than by questionnaire and that the particular concept of receiver control be a part of the study.

We would add further that the ERIC system give serious consideration to modifying its user education program so that information seekers might make more efficacious employment of its tools. One step in the right direction would be to alphabetize the thesaurus in the manner of Webster's New World Thesaurus, and include a "descriptive note" before each section of the thesaurus on its intended use. It might be a good idea to put the rotated descriptor display and the other features of the group display and so forth in the front of the thesaurus to encourage their adoption as part of the search process. A one-page display of instruction on the intended employment of all parts of the thesaurus inside the front and back covers would likely eliminate much trepidation new users must feel when confronted with trying to understand the system. Given thoughtful attention to these and other improvements, we feel that searchers who are predisposed to manipulate the ERIC system would do so more often. And we are not alone in our criticisms:

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[38] Ibid., p. 5.

[39] McCracken, J. David and Wilma B. Gillespie. *Information Needs of Local Administrators of Vocational Education...*Education. Final Report. Columbus, Ohio: Ohio State University: Center for Studies in Vocational and Technical Education, March 1973.

> At present it appears that the ERIC system people have a view of education and public school teaching which does not 'match-up' with the views of education and teaching held by many teachers. This, then, would be a strategic difference in orientation, and by and large, would not be solvable by tactical communication programs, such as promotional campaigns.[40]

As a further suggestion, ERIC might index its articles with descriptors which match those of the Education Index so that researchers who for decades have been accustomed to using the EI might easily swing over to ERIC where possible.

It should also become evident that whether information seekers use the Education Index or ERIC or any other system, the simple annexation of a bibliographic search does not stamp any work with validity. This paper does not list references at length to lend authority to its presentation. The purpose of a bibliographic search is to infuse the ideas of many thinkers into one cogent scheme, something every writer strives, sometimes in vain, sometimes in vanity, to do. Yet I have performed searches for other researchers whose addition of a bibliography to their work is simply to tack on a badge of authenticity to what is only their own view anyway, and a singular view at that. Ely discusses this abuse in his paper cited earlier, as shown in the following passage:

> Misconception: All information is of potentially equal value. The belief that the comprehensiveness of a bibliographic search adds validity to any proposition leads to the premise that more is better. The misconception here is that all data are of potentially equal value and that if a 'piece' of relevant information can be produced it ought to be utilized.
>
> Several studies find no correlation between the significance of a given scientist's contribution to knowledge and his use of the information systems available to him. The principle here is that an information system available equally for everyone is not equally useful to all potential users.[41]

Perhaps a useful conception to add here is the one offered by Rogers for the diffusion of innovations. If the makers of ERIC were to transform it to follow these stages, assuming they haven't already done so, we think it would mark an encouraging advancement.

1) Awareness - the individual first learns of the existence of a new idea, but really doesn't know very much about it;
2) Interest - he feels that the idea might be relevant to him and seeks to learn more about it;
3) Evaluation - the individual applies the idea to his own particular situation and assesses its value to him;

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[40]Deats, op cit., p. 391.

[41]Ely, op cit., p. 16.

4) Trial - he carries out more active evaluation by a "trial run" of this idea on a small scale; and
5) Adoption - finally, and only after passing through all the preceding stages, the individual adopts the idea and extends the trial to full and continued use.[42]

The awareness phase has been largely begun and should be continued at more strategic levels. Yet it is of course crucial that a tactical level of promotion accompany the more encompassing strategic baseplan for awareness of ERIC to become complete. The tactical level plays a less important part in the interest phase, since an understanding of the seeker's need for and acclimation to information occurs on the strategic level, is receiver-initiated, and must be intuitively addressed. Given an estimable, valid, and complementary climax to these first stages, we may likely expect the user to complete the last three stages by himself, and with sustained perdurability.

Description of Scope of the Study

Since the Amendments to the Vocational Act of 1963 included provisions advocating support of statewide information dissemination systems, and since many Research Coordinating Units have been commited to diffusing the results of their research to teachers, administrators, and other "field" personnel, we sought to deliver as inexpensively as possible other research information. The Center undertook to place a video-display terminal with keyboard in each vocational district and to train certain of the district staff to operate and promote its use. We set our hopes high that a bird weaned in the nest might possess enough imprinted interest to try to take its flight alone. In some cases, we were gratified tremendously. In most, we discovered a dashed frame on the ground which either never flapped vigorously or found itself unequal to the challenge.

Our intent was simply to coach users in their discovery of the ERIC files, and to assist them with locally-trained terminal operators who might go so far as to attempt helping them design their search profile. We conducted, over a period of two years, several "in-service" training sessions both locally and at the headquarters location in Madison. In addition to this we encouraged use of the system by description and demonstration, but confess that most of our efforts were at a tactical level because of a lack of commitment in dollars or time in the field.

Another Wisconsin system, WIRE (Wisconsin Information Retrieval for Education), has been in operation at the state Department of Public Instruction for almost three years. Its progress has been significant in getting a wide user group to request searches done centrally in Madison, and a locally operated design has been getting a good deal of push from the project's director. So we know that Wisconsin is ready for such a system. We have set the sails for a long journey, and with funding depleted we have bared the mast and allowed the current to drift us where it may. We see

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[42]Rogers, Everett K. Diffusion of Innovations. New York: The Free Press of Glencoe, 1962.

no storms on the horizon, and we feel that there is a good chance we will end up where we started to go. At least we have convinced some that the world is not flat. And those who have sailed with us have learned more than they set out to discover, and are telling the story honestly.

Methodology

In late August of 1974, the present information specialist and junior author took on the responsibility for presenting ERIC to vocational districts who were not served the previous year with a trial period of four months. The four month intervals were begun with delivery of an ITT Asciscope display terminal to the districts, a training session for district personnel on how to operate it, and an introduction to Wisconsin's computerized ERIC data base called WISE*ONE.

In the fiscal period for the previous year another specialist introduced ERIC to eight districts with the same trial interval. There was no real attempt to document progress on any sophisticated developmental scale. We simply wanted to give each district an opportunity to utilize a bibliographic system which had been enjoying a growing audience on the Madison campus of the University of Wisconsin.

Following delivery and instruction in the district, the second fiscal period saw development of use within the districts as necessarily a unipolar enterprise. Districts were left alone to promote use of the data base, and in-service training was withheld to an on-line conferencing function of all operators with the rest of Wisconsin's computer community. We knew of more valid approaches utilizing the field agent models, but were unable to implement such large scale efforts on a limited project basis.

Before 1974 had passed into its fourth quarter, the junior author determined that the best use which could be made out of WISE*ONE in order to serve the entire Wisconsin user base was to locate terminals in key districts around the state in the manner under development at WIRE. Therefore, terminals were jockeyed around to four districts where the user population had expressed the most interest or where the district operating personnel seemed most anxious to disseminate information on ERIC extensively. We were forced to ignore several potentially strong user groups whose interest and use was piqued by the presence of the computer terminal in a public location, but made a decision on location based on a combination of what part of the state could be served most economically with the presence of a terminal and which would service outlying districts by agreement if requests from these districts came in. Had we been able to leave a terminal in Rhinelander, we would have formed a kind of circle around the periphery of the state with Madison at the southernmost border serving all parts of the state below it and surrounding it. In the end we determined to best distribute terminals in a line started in the north with Shell Lake and drawn through Eau Claire, then across to the middle of the state at Wausau and south to Madison. We felt that operators in those locations conducted a worthwhile search function for users from anywhere else in the state.

Findings

A bipartite division takes form with terminal operators on one side and ERIC user groups on the other. While the terminal operators were skilled in using the system, their frustrations with providing ERIC searches for their user community were compounded by an ongoing battle with the computer to get information. WISE*ONE is a somewhat new program, initiated in the past few years as an intrepid undertaking to make use of ERIC a more realizable charge for users who had years of bibliographic review to catch up on in compiling their research accounts. As discussed earlier in the section headed 'information saturation,' many investigators, in which group we place students and faculty, teachers and administrators, novices and masters, have found themselves over their heads in information provided by ERIC (and other sources) and who were accorded an opportunity to search years of documents (titles, authors, and references) in the short time it takes a computer to pick them out.

But operators were not typically skilled in trouble-shooting computer breakdowns, and with the relatively new system, breakdowns occurred. And while the few times computer failures were experienced would not be disheartening to a computer specialist, it was a devastating disabusal to a non-computer impresario whose function was conceived as that of providing a service function to a needy community.

The user community, whose needs were identified only by what they told the terminal operator, were discouraged at being put off with excuses of computer error. Yet this was not the only outcome of the endeavor; it was just that when things go sour in computers, they tend to leave a bad taste on the tongue for a lingering time. By and large, computer terminal operators were able to service requests expediently and successfully, and did so with creditably ingenius rapport and with enthusiasm. Users who received the information they perceived was the most useful were encouraged to return for additional information. Those who found it necessary to return for a new estimation of the search profile in order to isolate their interests more exactly were not reluctant to do so in cases where they rated highly initially the capacity of a computer to assist them in a formidable task. By and large, we feel that, for those we reached with this project, much advancement has been made in promoting and emandating the ERIC system. On a statewide level of involvement, our project has made a mini-contribution, however, to serving the needs of the community, whatever they may be.

We discovered, then, that we could implement an information dissemination system which seekers of information would use. What we could not do was predict how much use it would get, who the users would be who identified a "degree of fit" between what we had to offer them and what they wanted to see, and whether it would be possible for such a system to be self-sustaining. In the following section we will present what we consider to be some of the most important strategic and tactical procedures for delivering a statewide information dissemination system.

Conclusions and Recommendations

Gregory Benson remarks in an article about dissemination that "routine service functions related to the ERIC data base should include computerized searching, selective dissemination and microfiche reproduction...Regardless

of the...data bases utilized, the service functions remain essentially library-oriented."[43] We have outlined in some detail our feelings about how state agencies for dissemination of information ought to be organized, and we are hoping that library-oriented functions will become more receiver-controlled than source-controlled operations. Benson continues that regional staff, that is, staff located in close proximity to the user population base, should be trained in assessing the computer facility and capable of relating to the needs expressed by educators. Ideally this should be a core staff of subject specialists located in the region. Users should be able to draw upon the services of a regional information specialist who is knowledgeable about and capable of assessing the various information sources.

Unfortunately, we were not able to provide a regional information specialist with all these qualifications. His salary alone would have consumed almost two-thirds of the total budget we operated on. The information specialist in Madison was able to handle questions from the user communities when those questions were directed through the local terminal operator. But this does not fulfill the expeditious anticipations of user groups or of service-committed terminal operators trying to assist those groups.

There is a rather well-developed model of an information specialist's skills and management function in two separate writings. Becker and Hayes, pioneers in the field of information science, wrote extensively to this view in "A Plan for a Wisconsin Library and Information Network."[44] The outcome of this plan was the establishment of the Wisconsin Information Retrieval for Education (WIRE) mentioned earlier. Building on the model of the "linker" of information originating with Havelock,[45] Farr elaborates on the need for this knowledge link between the source of knowledge and the application of knowledge and associates the knowledge "linker" with Kurt Lewin's "gatekeeper" concept.[46]

In the work of Farr, the gatekeeper term is chosen in preference to several others whose names describe more expressively their identities: they are opinion leaders, influentials, and early adopters. Farr defines the gatekeeper as "certain individuals in the mass audience [who] are more active

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[43]Benson, Gregory M., Jr. *Dissemination as a Process Component with Implications for Organizing a State Agency Dissemination Unit.* Albany, New York: New York State Education Department, Educational Programs and Studies Information Services, De 1972.

[44]Becker, Joseph and Robert M. Hayes. *A Plan for a Wisconsin Library and Information Network: Knowledge Network of Wisconsin.* Madison, Wisconsin: Division for Library Services, Wisconsin Department of Public Instruction Oc 1970.

[45]Havelock, R. G. *Dissemination and Translation Roles in Education and Other Fields, a Comparative Analysis.* Ann Arbor: University of Michigan, Center for Research on Utilization of Scientific Knowledge, 1967.

[46]Lewin, Kurt. "Group Decision and Social Change" in E. Maccoby, T. Newcomb and E. Hartley (eds.), Readings in Social Psychology. New York: Holt, Rinehart and Winston, Inc. 1947.

than others in introducing new information into the network."[47] In the abstract of this document by ERIC a paragraph describes the relationship between the linker and the gatekeeper:

> The linker enters this [interpersonal network of communication] by contacting individuals in the audience who are more active than others [the gatekeepers]. Once gatekeepers have been identified, the linker, aware of the stages through which idea adopters must pass before accepting a new idea, must successfully communicate to them an understandable, attention-getting message which arouses personality needs and makes appropriate suggestions to meet these needs. This message is then passed on to the rest of the target audience by word of mouth. The linker must also actively solicit audience needs and apply them to research products, serving as a two-way force for facilitating the flow of information.[48]

Farr's report is instinctive to the needs of seekers of information. He realizes it cannot be the knowledge producers function to propel knowledge through the "knowledge flow system." And, it is equally unlikely that all educational information is going to be immediately applicable in its research form: it must be reviewed by a competent innovator and its use synthesized out before its research-oriented writing can be translated into practical methods.

Exploitation of the linker/gatekeeper model seems an excellent means of incorporating the thinking of other contributors mentioned earlier. Our first recommendation is that designers of future systems of information dissemination, especially when dissemination is attached to knowledge production but certainly also in instances where they are segregated, launch elaborate plans for implementing this system or one like it. We feel that the linker/gatekeeper concept allows room for spontaneous development of systems design while providing the backbone of sound and authentic planning. We sympathize with the following from Deats, but still respond most heartily to having an efficient and well authenticated plan of procedure for operations planning:

> [One of the false conceptual orientations in education is] the general assumption which contends that planned alterations and modifications within educational systems change such systems in the best way, rather than assuming that the best change might occur without or despite such planning and controlling activity.[49]

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[47]Farr, Richard S. *Knowledge Linkers and the Flow of Educational Information. An Occasional Paper from ERIC at Stanford.* Stanford University, California ERIC Clearinghouse on Educational Media and Technology. Se 1969.

[48]Farr, op cit., ERIC Report Resume.

[49]Deats, op cit., p. 388.

We know from our experience and the experiences of Wisconsin information retrieval specialists and the available literature that an unplanned approach to information dissemination is at best a short path to ruin. We began with a plan which was insufficient and did not recognize the budget commitments necessary to make our plan work. We ended up with a project which got the word on ERIC out to more people than it has reached in the last ten years, but we did not get accomplished all of what we wanted to do. We could not get the vocational schools to realize some inherent, indigenous worth to the WISE*ONE information retrieval processor with ERIC so that they would continue the funding necessary to support it after the federal seed money had expired. Our plan was grandiose but it was not grand enough. We don't see our attempt as a failure by any measure, but we failed in what we would like to have seen it become.

Associated with the Havelock model of "linker" design are two problems which he considers in his paper, Farr reviews in his, and which we think it important to include here. The first operational problem linkers face is work overload. Farr thinks the reason is because,

> The entire concept of a linker suffers from a *lack of recognized precedence* for such a person. Information storage, retrieval and exchange as a science and legitimate academic pursuit is only a recent development...Libraries collect information, but really go little further...they rely on audience initiative to start any information exchange...The new information sciences, psychology, rural sociology, communication research, marketing, and others all bear in one way or another on the problems facing the linker. The lack of precedent for the linker really means that no one has ever attempted to pull together the relevant materials from all these areas and show their applicability.[50]

Actually, this is not strictly true. There have been monumental attempts to launch such efforts, one of the most consequential being the origination of a magazine for the popular reader in early 1970. It was called the *Intellectual Digest*, it was boastful of a subscribership of 450,000, supported by industries like Ziff-Davis Publishing (Popular Photography, Car & Driver, Cycle, Boating, Stereo Review, Popular Electronics) and Communications Research Machines (Psychology Today), and died a slow and agonizing death with circulation problems. In short, it was another instance of not really knowing what the market was, what people wanted and why, and how to produce it in a marketable form (which could not be, almost by design for *Intellectual Digest*) which was receiver-oriented. It got off to a galloping start several times, each time changing managership, but lost its balance despite such encouraging original comments like "exactly what I needed to keep up with all the magazines I want to read but don't."

The second problem which linkers face is one of *marginality*. The linker is not a member either of the originating community or the receiving community. Therefore, he has always the enigma of validating his credibility. But, Farr submits, "...while marginality is inherent in the role of the linker, it can be construed as an advantage as well as a disadvantage.

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[50]Farr, op cit., p. 5.

The impartial, 'no-axe-to-grind' middleman is able to maintain a certain trustworthiness and credibility attainable by no one else."[51] Farr recomends that "linkers" be actual institutions, like the notion of the education industries which have been employed in accountability models. In reiterating Havelock, Farr justifies the institutionalization of linking functions because it attenuates the strain on individuals assigned this overloaded function, and because an institution offers the obvious securities and identity individuals need, especially in a position of some academic indistinctness. Furthermore, Farr asserts, institutionalization permits the necessary coordination of multiple functions and specialization by individuals in various areas of the linking task. We look upon this institutionalization as something akin to the organization Encyclopedia Britannica, itself affiliated with the University of Chicago for ultimate institutionalism. We also have some question about whether institutionizing information has merit as a model, and echo Ely's comments in this regard:

> Misconception: Information is best handled in institutional settings.[52]

But if institutions can be viable, we recommend institutionalizing the linking function where the commissioned firm is financially responsible for its results.

As a final recommendation, we wish to emphasize the gatekeeper function. Though we do not like the term Farr has chosen because of its negative connotations in connection with that function of guidance counselors,[53] we are willing to work with it if our readers will detach us from that association. And, in connection with our discussion of gatekeepers, it is important to offer Farr's comments on barriers to change in the educational system. With that we will conclude this presentation and wish other information disseminators luck.

Farr refers to data available from communications research of three decades ago which says that "ideas do not flow directly from the mass media to the mass audience, but from the media to selected individuals in the audience and then on through the remainder via interpersonal channels of communication."[54] Magisos, in his survey of target audience needs, details this point, presenting evidence that "direct and personal contact are judged by respondents to be most useful."[55] In providing this direct and personal contact with the user group, the gatekeeper plays an integral role.

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[51]Farr, op cit., p. 4.

[52]Ely, op cit., p. 16.

[53]Erickson, Frederick. "Gatekeeping and the Melting Pot." Harvard Educational Review 45(1). 44-70, Fe 1975.

[54]Farr, op cit., p. 10.

[55]Magisos, Joel H. *Interpretation of Target Audience Needs in the Design of Information Dissemination Systems for Vocational and Technical Education.* Columbus, Ohio: Ohio State University, Center for Studies in Vocational and Technical Education, 1971, p. 23.

The gatekeeper, says Farr, is distinguishable from the remainder of the audience in several ways. He uses the mass media and other sources outside his field more frequently than others of the user group. Other characteristics which make him outstanding are his "cosmopoliteness" or general orientation toward persons and topics external to the group, his maintenance of a high level of social participation, and his position with relation to his contemporaries to which he is usually superior in some way. He is also likely to be more innovative than his user group, and with all these attributes he provides access to the target audience. His attention is the most accessible to the information disseminator as well, and this quality Stern attempted to employ in his several approaches to information seekers in a university system.[56]

In employing the methods we have discussed, a final note must be kept in mind. It is not only individuals who do not change easily; the same is true of institutions, perhaps more true than for individuals. Mort, at Teachers College, Columbia University, has concluded that it takes approximately fifty years for change to permeate the education stronghold.[57] Carlson gives some reasons for this, and Farr lists them with explanations.[58] "The first is the lack of educational change agents."[59] We have addressed this issue at some length in the foregoing sections, and identified the need for education "linkers" and "gatekeepers."

"The second barrier to educational change is the so-called weak knowledge base."[60] We ran into this in several of our vocational district locations, and with one district director. Most educators look upon research as having questionable significance to their work, and, Pellegrin says, this allows an atmosphere of low motivation given to the conduct or utilization of research which makes research look like a dubious enterprise and circumambulates the process. It is the breakdown in thinking altogether when it comes to use of research or reading of important information which creates this process and starts this circular reasoning going. Can education practitioners really think they have it all put together? They can, and they do in many cases. It is that mind set of resistance which we discussed earlier and to which we have been referring throughout with suggestions for overcoming it. One cannot, of course, expect the schools to change every time new research comes out; education cannot exist on research alone. But it cannot exist without it either, because the driving reason

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[56]Stern, Louis W. et al. "Promotion of Information Services: An Evaluation of Alternative Approaches." Journal of the American Society for Information Science 24(3), 171-79, My/Je 1973.

[57]Mort, Paul R. "Studies in Educational Innovation from the Institute of Administrative Research: An Overview." In M. B. Miles (Ed.), Innovations in Education. New York: Columbia University Teachers College Bureau of Publications, 1964).

[58]Carlson, Richard O., "Barriers to Change in the Public Schools." In Richard O. Carlson et al. (Eds.), Change Processes in the Public Schools. Eugene, Oregon: University of Oregon, Center for the Advanced Study of Educational Administration, 1965.

[59]Farr, op cit., p. 8.

[60]Farr, op cit.

behind education at all is to educate. It is part of the cancer in the educative exercise that stagnation represents; once educated it is done and you never have to learn again. What folly!

Finally, the schools are also domesticated, says Carlson, which "refers to the fact that they do not select their students and their students do not select them."[61] This produces a competitive state which Farr regards as largely just a state of mind rather than actuality, although the domesticity does "restrict the need for, and interest in, change because the environment of domesticated organizations in many important respects is more stable than it is in other types of organizations."[62] In this last respect, Farr submits, competition is a wasteful and dysfunctional rivalry which stands before better methods like Goliath before David.

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[61]Farr, op cit.

[62]Carlson, op cit., p. 7.

APPENDIX A

Respondents were asked to check the statement(s) that applied:

VTAE DISTRICTS AND LOCATION OF THEIR ADMINISTRATIVE CENTER	See next page for additional comments	We are not interested in pursuing further use of the information retrieval system...	We would like to have the Center* continue the in-service for information retrieval...	We intend to rent or purchase a terminal and will use it for information retrieval...	We currently have a terminal which could be used and are interested in using the system...
Blackhawk (Janesville-Beloit)			X		
Fox Valley (Appleton)		X			
Gateway (Kenosha-Racine)	X	X			
Lakeshore (Cleveland)	X	X			
Mid-State (Wisconsin Rapids)	X				
Milwaukee		X			
Moraine Park (Fond du Lac)					
Nicolet (Rhinelander)		X			
North Central (Wausau)					X
Northeast (Green Bay)		X			
Southwest (Fennimore)	X	X	X		
District 1 (Eau Claire)	X				X
District 4 (Madison)		X			
Waukesha	X				
Western (La Crosse)	X		X		
Indianhead (Shell Lake)			X	X	X

ADDITIONAL COMMENTS FROM DISTRICTS
NOTED ON PRECEDING PAGE

Gateway....."We do not have enough use of the terminal to justify rental or purchase. We would like the State Office to conduct our searches."

Lakeshore....."Not feasible for our district. If needed, terminal at another district could be utilized."

Mid-State.....(Editorial Note) We could not install a terminal in this location.

Southwest....."We did have a terminal which was utilized to some extent by district faculty. However, at the present time we are not interested in renting or purchasing due to budgetary considerations. We would like the Center* to continue the in-service for the Information Retrieval System with hopes that in the future we could again participate, but with our own terminal."

District 1...."Our continued support of this terminal would be contingent upon enlargement of the data base(s)."

District 4...."We have met with our administrative staff and decided that we would not be interested in participating in the Information Retrieval Project."

Western....."We no longer have the manpower to carry out this project."

APPENDIX B

WISE*ONE EXECUTIONS AND COSTS*

March 1974	29	$ 40.41
April	102	139.23
May	111	176.29
June	177	560.47
July	126	640.87
August	64	201.19
September	61	196.51
October	109	116.98
November	40	54.69
December	88	83.32
January 1975	120	190.21
February	134	119.01
March	71	55.88
April	70	157.66
May	137	116.73

Cost run figures should not be construed as indicative of what charges would accrue to a normal user who only searched the data base. Larger-than-normal charges were accrued for advanced runs in which additional files were catalogued and many "save files" were collected. Typically, "saved files" either were not unloaded from the tape drive by the user (thus assuming expense in the run for tying up a tape drive) or were saved overnight or for longer periods of time (accruing charges both for mass storage and cataloguing each day).

*Costs included only computer-time services and do not reflect terminal rentals, leases, or purchases or telephone costs.

APPENDIX C

Location of Materials

ED documents in the ERIC library are available in their entirety from the ERIC Document Reproduction Service, P. O. Drawer O, Bethesda, Maryland, 20014. Libraries in Wisconsin which currently maintain ERIC microfiche collections are:

Department of Public Instruction Professional Library, 126 Langdon Street, Madison 53702, 608-266-2529.

Instructional Materials Center, Teacher Education Building, 225 North Mills Street, UW-Madison 53706, 608-263-4750.

Wisconsin Board of Vocational, Technical and Adult Education, 4802 Sheboygan Avenue, 7th Floor, Madison 53705, 608-266-3705.*

UW-Milwaukee Library, 2500 E. Kenwood Blvd., Milwaukee 53211, 414-228-4785.

UW-Parkside Library, Public Services Division, Kenosha 53140, 414-553-2360.

Waukesha County Technical Institute Library, 800 Main Street, Pewaukee 53702, 414-691-3200.

Robert L. Pierce Library, UW-Stout, Menomonie 54751, 715-235-5541.

William D. McIntyre Library, UW-Eau Claire 54701, 715-836-3715.

Forrest R. Polk Library, UW-Oshkosh 54901, 414-235-6220.

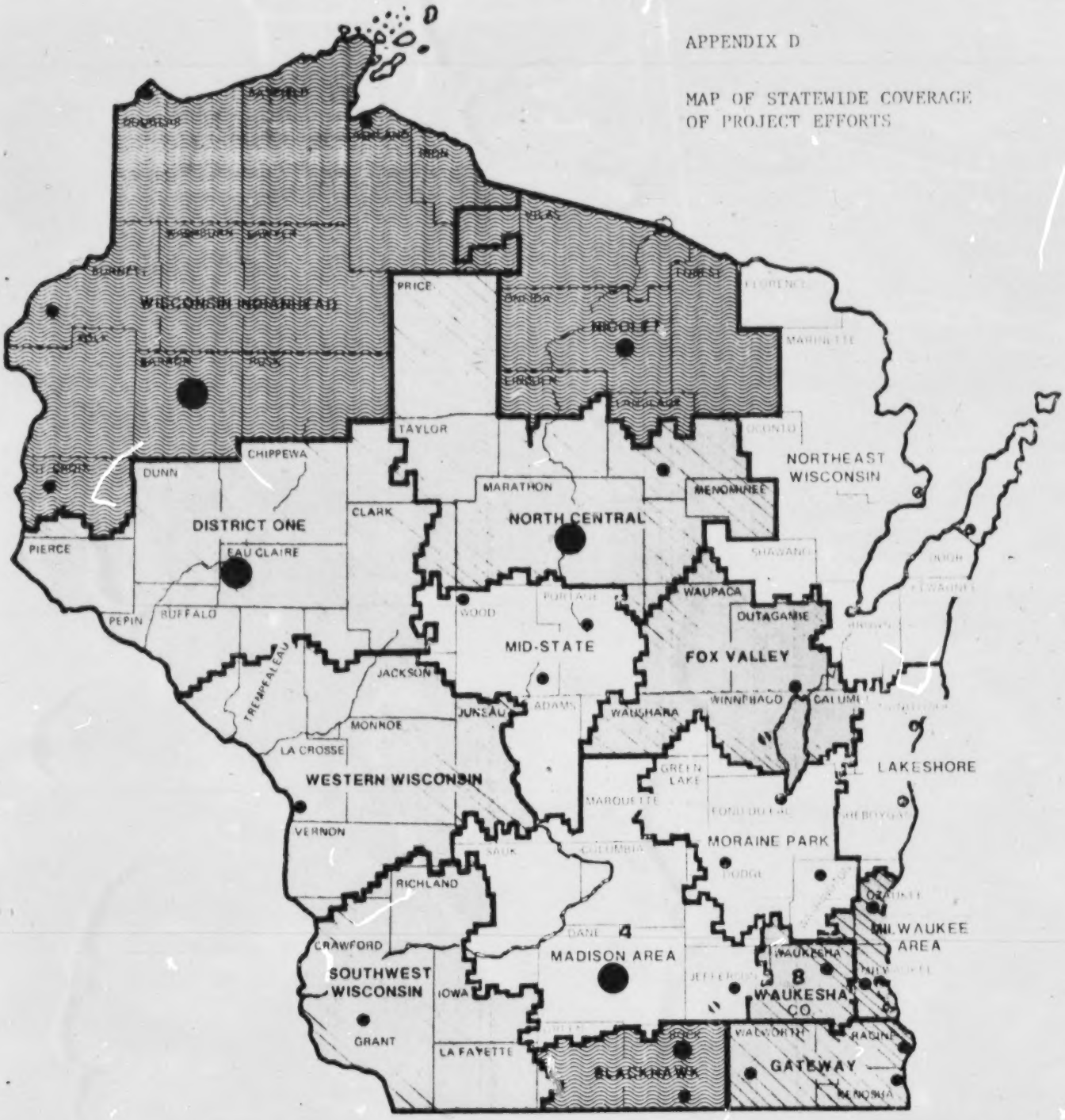
Chalmer Davee Library, UW-River Falls 54022, 715-425-6701.

Harold Anderson Library, UW-Whitewater 53190, 414-472-4671.

*The State Board Office has the capability of reproducing microfiche copies, which are available at the cost of 25¢ per microfiche card through Mr. Roland Krogstad. A microfiche card is a 4 by 6 inch sheet of microfilm on which up to seventy pages of text are reproduced; a microfiche reader is required.

APPENDIX D

MAP OF STATEWIDE COVERAGE
OF PROJECT EFFORTS



Lightly-shaded areas were those included in the first year of the project. Darker, or wavy-shaded areas were added the second year. The white areas of the state were not able to be included for various reasons.

APPENDIX E

SERVICES and FACILITIES

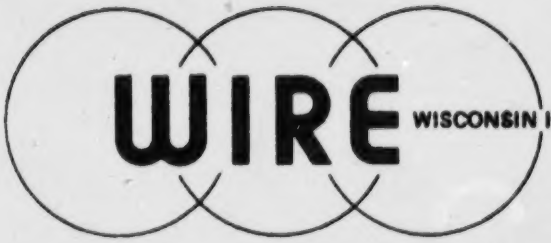
ACADEMIC COMPUTING CENTER, UW-MADISON (MACC)

MACC is a centralized computing facility for serving the instructional and research computing needs of the Madison campus. The computing center also serves other campuses of the University of Wisconsin System and secondary schools. The Center's goals are to make its facilities and services easy to use, responsive to the diversified requirements of all segments of the educational community and low in cost.

User Services include: counseling potential new users, support for existing users, consulting, applications analysis, instruction and training, documentation, contract programming and keypunching. The Center also provides storage and retrieval services for Educational Research Data (ERIC), and a variety of ready-to-use programs for the educational environment.

The main computing equipment consists of a Univac 1110 with the EXEC operating system. Plotting, keypunching and unit record equipment are also available at the Dayton Street site. In addition to the main I/O counter at Dayton Street, access to the 1110 is available from a number of remote batch I/O stations located around the Madison campus, and at the other UW campuses. The Center has developed low-cost card reader/printer terminals which operate as remote batch I/O stations (RJE) to the 1110. Also available are low-cost graphic display terminals, and associated software which enables them to be operated on-line to the 1110 via voice grade telephone lines, and located wherever convenient for users. A front-end data concentrator to the 1110 provides approximately 60 ports for timesharing access to the 1110 via the public telephone network, using keyboard/printer and keyboard/CRT terminals.

APPENDIX F



WISCONSIN INFORMATION RETRIEVAL FOR EDUCATION

WISCONSIN DEPARTMENT OF PUBLIC INSTRUCTION
DR. BARBARA THOMPSON, STATE SUPERINTENDENT

WIRE

WISCONSIN INFORMATION RETRIEVAL FOR EDUCATION

WHAT IS WIRE?

AN ON-LINE INTERACTIVE INFORMATION RETRIEVAL SYSTEM WHICH:

1-- SEARCHES OVER 140,000 DOCUMENTS IN THE ERIC SYSTEM.

2-- PROVIDES BIBLIOGRAPHIES OF COMPLETE ERIC ABSTRACTS.

3-- RETURNS AN INDIVIDUALIZED SEARCH IN ONE TO TWO WEEKS.

WIRE was conceived as a demonstration project by the Department of Public Instruction to provide Wisconsin educators individualized access to current educational research and resource information. Initially funded through ESEA Title V (Improving State Departments of Education), WIRE started operation November 15, 1972. The project resides in the Information Systems Section of the Division for Planning Services.

The project Administrator is Don Russell, Chief of the Information Systems Section. The project Coordinator is Roy Tally, Education Data Coordinator for the DPI.

HOW DOES WIRE WORK?

1-- YOU SUPPLY THE QUESTION (BY PHONE, BY FORM, BY VISIT).

2-- WE CONDUCT THE SEARCH, PRINT AND SCREEN THE ABSTRACTS AND ANNOTATIONS FROM ERIC.

3-- YOU READ THE ABSTRACTS AND ANNOTATIONS, THEN:

- -- RETURN THE EVALUATION FORM TO WIRE,
- -- ORDER COMPLETE DOCUMENTS,
- -- ASK FOR FOLLOW-UP SEARCHES.

WHO CAN USE WIRE?

1-- COORDINATORS AND SPECIALISTS IN CESA'S - (SEARCHES ON REGIONAL COOPERATION, INTERMEDIATE ADMINISTRATIVE UNITS, DATA PROCESSING CENTERS, REGIONAL PROGRAMS).

2-- SUPERINTENDENTS, SUPERVISORS AND STAFF IN DISTRICTS - (SEARCHES ON BOND ISSUES, STATE-SCHOOL DISTRICT RELATIONSHIP, CURRICULUM DEVELOPMENT, PLANNING MODELS).

3-- PRINCIPALS, TEACHERS AND PARAPROFESSIONALS IN SCHOOLS - (SCHOOL SAFETY, SCHEDULING, SCHOOL-COMMUNITY PROGRAMS, INNOVATIVE COURSES, INDIVIDUALIZED INSTRUCTION).

4-- GRADUATE STUDENTS, MEMBERS OF EDUCATIONAL COMMITTEES AND LAYMEN CAN USE WIRE.

WHAT DOES WIRE COST?

THE USER PAYS A FEE OF $10.00 PER SEARCH WHICH INCLUDES:

1-- QUESTION NEGOTIATION OR CLARIFICATION.

2-- COMPUTER SEARCH ON ALL APPLICABLE DATA BASES OF THE ERIC SYSTEM (RIE, CIJE, AIM-ARM).

3-- FULL PRINT-OUT OF ERIC ABSTRACTS AND ANNOTATIONS.

4-- FREE FOLLOW-UP SEARCH IF NECESSARY.

WHY SHOULD YOU USE WIRE?

1-- TO PRODUCE A BETTER PAPER, COURSE, CURRICULUM OR PROJECT.

2-- TO AVOID "REINVENTING THE WHEEL".

3-- TO SAVE THE TIME (WHICH IS MONEY) OF MANUAL SEARCHING.

4-- TO BENEFIT FROM OTHER'S EXPERIENCE.

5-- TO EXPLORE AREAS OF INTEREST AND KEEP UP TO DATE.

6-- TO HAVE PERSONALIZED ACCESS TO THE LARGEST SINGLE SOURCE OF INFORMATION ON EDUCATION.

WHERE IS WIRE AGAIN?

CONTACT: ROY TALLY, EDUCATION DATA COORDINATOR
WIRE
DEPARTMENT OF PUBLIC INSTRUCTION
126 LANGDON STREET
MADISON, WISCONSIN 53702

(608) 266-2127 OR 266-2741

THESE ARE SAMPLES OF WIRE ABSTRACTS AND ANNOTATIONS

••••••••••••••••••••••••••••••••••••

REPORT NUMBER EJ043984

TITLE EDUCATIONAL METHODOLOGY: AN EXAMINATION OF APPROACH

AUTHOR(S) DREW, CLIFFORD J.; MARTINSON, MELTON C.

JOURNAL EXCEPTIONAL CHILDREN; 38; 2; 117-20

PUB DATE OCT 71

DESCRIPTORS
EDUCATIONAL METHODS
INFORMATION DISSEMINATION
RESEARCH UTILIZATION
EDUCATIONAL NEEDS
MODELS

••••••••••••••••••••••••••••••••••••

REPORT NUMBER EJ043150

TITLE THE UTILISATION OF EDUCATIONAL RESEARCH AND DEVELOPMENT

AUTHOR(S) HAVELOCK, RONALD G.

JOURNAL BRITISH JOURNAL OF EDUCATIONAL TECHNOLOGY; 2; 2; 84-98

PUB DATE MAY 71

ANNOTATION
THE AUTHOR SUGGESTS THAT "WE NEED TO BUILD NATIONAL SYSTEMS WHICH ALLOW ANY SCHOOL DISTRICT TO PLUG INTO THE MOST SOPHISTICATED SOURCES OF INFORMATION IN SUCH A WAY THAT THEY GET KNOWLEDGE AND MATERIALS WHICH ARE RELEVANT AND TIMELY AND TRULY COST BENEFICIAL." (AUTHOR/AK)

DESCRIPTORS
ADOPTION (IDEAS)
EDUCATIONAL RESEARCH
MODELS
RESEARCH AND DEVELOPMENT CENTERS
DIFFUSION
INFORMATION DISSEMINATION
REGIONAL PROGRAMS

••••••••••••••••••••••••••••••••••••

REPORT NUMBER ED032792

TITLE INFORMATION REQUIREMENTS FOR PLANNING INSTRUCTIONAL STRATEGIES: AN ANTHOLOGY FOR TEACHERS AND PRINCIPALS.

AUTHOR(S) HISH, JOHN, ED.; AND OTHERS

SOURCE CENTRAL ATLANTIC REGIONAL EDUCATIONAL LAB., INC., ALEXANDRIA, VA.

PUB DATE JUN 69

NOTE 209P.

ABSTRACT

THE INTRODUCTION TO THIS ANTHOLOGY REPORTS A STUDY DESIGNED TO DEVELOP A SYSTEMATIC PROCEDURE FOR GATHERING INFORMATION FROM ACTUAL SCHOOL SETTINGS ABOUT THE IMPACT OF SCHOOL ORGANIZATION, STAFFING, AND ADMINISTRATION ON STUDENTS--INFORMATION TO PROVIDE BASELINE DATA FOR DECISIONMAKERS. INCLUDED ARE DESCRIPTION OF METHODS AND PROCEDURES, DATA ANALYSIS TECHNIQUES, AND SPECIFIC OBJECTIVES WHICH INCLUDED (1) SELECTION, MODIFICATION, AND DESIGN OF INSTRUMENTS FOR GATHERING DATA REGARDING STUDENTS, TEACHERS, PARENTS, PRINCIPALS, AND TEACHER AIDES, PERCEPTS OF SELECTED ISSUES IN THE ELEMENTARY SCHOOL AND INSTRUMENTS FOR MAKING OBJECTIVE OBSERVATIONS OF CLASSROOM ENVIRONMENT, AND (2) GATHERING BASELINE INFORMATION ON ONE PUBLIC AND ONE NONPUBLIC (ONE CENTRALIZED AND ONE DECENTRALIZED) ELEMENTARY SCHOOL IN URBAN, DEPRIVED ENVIRONMENTS. THE EIGHT CHAPTERS, EACH WRITTEN BY A SPECIALIST IN THE AREA OF CONCERN, PRESENT DIFFERENT ASPECTS OF THE STUDY: THE PLACE OF OBJECTIVE INFORMATION IN TOTAL SCHOOL PLANNING; CRITICAL INFORMATION REQUIREMENTS IN THE MANAGEMENT OF THE ELEMENTARY SCHOOL; ANALYSIS AND IMPLICATIONS OF STUDENT, TEACHER, AND PARENT PERCEPTS OF STUDENT PERFORMANCE; PROFESSIONAL STAFF ENCOUNTERS; CLASSROOM ECOLOGY; GENERAL ATMOSPHERE FOR ADMINISTRATIVE AUTONOMY; THE ATMOSPHERE FOR DECISION MAKING; THREE VIEWS OF THE TEACHER AIDE; AND COMMUNITY INTEREST IN LOCAL SCHOOL MANAGEMENT. (JS)

DESCRIPTORS

CLASSROOM ENVIRONMENT
COMMUNITY INVOLVEMENT
DECENTRALIZATION
ELEMENTARY SCHOOLS
MEASUREMENT INSTRUMENTS
SCHOOL ENVIRONMENT
SCHOOL PLANNING
TEACHER AIDES
CLASSROOM OBSERVATION TECHNIQUES
DATA COLLECTION
DECISION MAKING
INFORMATION SOURCES
SCHOOL ADMINISTRATION
SCHOOL ORGANIZATION
STAFF ROLE
URBAN SCHOOLS

WISCONSIN DEPARTMENT OF PUBLIC INSTRUCTION
WISCONSIN INFORMATION RETRIEVAL FOR EDUCATION
INFORMATION RETRIEVAL REQUEST
PI-PS 2 (R. 7 73)

WIRE

INSTRUCTIONS: Return request to
Information Services Section
Management & Planning Services Division
Department of Public Instruction
126 Langdon Street
Madison, Wisconsin 53702

NAME OF PERSON REQUESTING INFORMATION	POSITION OR TITLE	HOME TELEPHONE AREA / EXCH. / NUMBER	REQUEST DATE
ORGANIZATION NAME (SCHOOL DISTRICT)		BUSINESS TELEPHONE AREA / EXCH. / NUMBER	DATE NEEDED
STREET ADDRESS	CITY	STATE	ZIP CODE
REQUEST AUTHORIZED BY (If Different from Above)	PURCHASE ORDER NO. (If Necessary)	Is this your first request? ☐ Yes ☐ No	

NOTE: The most important factor in obtaining relevant information on your topic is effective communication of your need to the Information Retrieval Center. Please think your request through thoroughly and fill in this form completely. Care taken at this point will have considerable effect on the quality of the information you receive.

1. WHAT IS THE **TITLE** OR **MAJOR SUBJECT AREA** OF YOUR REQUEST? _____

2. WHICH OF THE FOLLOWING LEVELS (IF ANY) APPLY TO YOUR TOPIC? (CHECK ALL THAT APPLY)

☐ PRE PRIMARY ☐ INTERMEDIATE ☐ SENIOR HIGH ☐ COLLEGE ☐ ADULT
☐ KINDERGARTEN ☐ ELEMENTARY ☐ SECONDARY ☐ GRADUATE ☐ PROFESSIONAL
☐ PRIMARY ☐ JUNIOR HIGH ☐ JUNIOR COLLEGE ☐ HIGHER EDUCATION ☐ NO LEVEL
☐ OTHER (Specify) _____

3. WHAT IS THE GENERAL PURPOSE OF YOUR INFORMATION SEARCH?

☐ PROPOSAL DEVELOPMENT ☐ ADMINISTRATIVE MANAGEMENT ☐ COURSE REVIEW OF LITERATURE
☐ PROJECT OPERATION ☐ INSTRUCTIONAL IMPROVEMENT ☐ INSERVICE TRAINING
☐ CURRICULUM DEVELOPMENT ☐ THESIS/DISSERTATION ☐ SCHOOL/COMMUNITY RELATIONS (Communication)
☐ OTHER (Specify) _____

4. WHAT TYPE OF SEARCH DO YOU NEED? ☐ OVERVIEW ☐ IN DEPTH ☐ PROGRAM ORIENTED ☐ RESEARCH ORIENTED

5. HOW MANY REFERENCES DO YOU EXPECT OR PREFER? ☐ UP TO 10 ☐ UP TO 25 ☐ UP TO 50 ☐ UP TO 75 ☐ OVER 75

6. PLEASE WRITE A **DETAILED STATEMENT** DESCRIBING YOUR SPECIFIC INFORMATION NEEDS IN YOUR OWN WORDS, CONSIDERING THE INFORMATION INDICATED BY YOUR CHOICES AS CHECKED. BE SPECIFIC AS POSSIBLE. USE ADDITIONAL SHEETS IF NECESSARY.

7. IF POSSIBLE, LIST AUTHORS' NAMES, PROJECT/PROGRAM TITLES, ERIC ABSTRACTS (ED NUMBERS), DESCRIPTIVE TERMS, AND ANY OTHER PERTINENT INFORMATION WHICH MAY BE HELPFUL SEARCH KEYS TO THE RETRIEVAL STAFF.

FOR OFFICE USE ONLY

RETRIEVAL NUMBER	CASE NUMBER	REQUEST TAKEN BY: Initial / Phone / Mail / Visit	SENDER INITIAL	CLIENT	ACTION TAKEN ON SEARCH

TOTAL TIME MINUTES	CHARGES $	REQUEST RECEIVED DATE	REQUEST PROCESSING DATE	REQUEST COMPLETION DATE

WIRE

* uses the latest computer technology to search more than 140,000 documents in the ERIC system.

* gives you access to the latest research and resource material in education.

* provides searches for information on your individual topic.

* saves time for you by sending only what you ask for.

* operates on a cost recovery basis. Charges are $10 per search with reruns if necessary at no charge.

For More Information or Requests Call:
Roy Tally, Educational Data Coordinator
(608) 266-2127 or 266-2741

Fold 1

Fold 2

STAMP

WIRE
Division for Management & Planning Services
Department of Public Instruction
126 Langdon Street
Madison, Wisconsin 53702

APPENDIX G

WISE*ONE USER DOCUMENTATION

WISCONSIN INFORMATION SYSTEMS FOR EDUCATION (WISE)

User Documentation WISE-ONE

By:
Tom Olson
Donald N. McIsaac
Dennis W. Spuck
Roy D. Tally

Introduction

The Educational Resources Information Center (ERIC) program was designed by the U.S. Office of Education, and is now supported by the National Institute of Education (NIE) to facilitate ready access to literature relevant to education. The ERIC System center collects abstracts, classifies and catalogs this information and publishes resumes of all reports in the monthly periodical of Research in Education (RIE) and Current Index to Journals in Education (CIJE). In addition to these periodicals, ERIC produces copies of RIE abstracts and CIJE annotations in machine readable form through a subcontractor. The subcontractor, Leasco Information Systems of Bethesda, Maryland, provides the ERIC files on computer tape to subscribers on a monthly, quarterly or annual update basis.

While a manual search of the thousands of documents catalogued each month using the ERIC Journals and indexes is possible, this process is extremely time-consuming and frequently overlooks some documents. WISE-ONE, an information-retrieval system, was designed to facilitate searches of the documents catalogued by the ERIC centers and distributed as ERIC RIE and ERIC CIJE Master Tape files.

The ERIC search program - WISE-ONE - was funded by the School of Education, Department of Educational Administration, Wisconsin Information Systems for Education (WISE). Mr. S.C. Yang and Professor Venezky contributed to the development of the hashing scheme. The program was also a class project in Computer Science - CS 638 taught by Professor Travis. These contributions are acknowledged and appreciated.

Documents catalogued in the ERIC files are indexed by descriptors, identifiers and author names. Descriptors characterize the substantive content of the report and are themselves indexed in the ERIC Thesaurus of Descriptors.[2] Additional terms not listed in the Thesaurus, but which are useful in describing a particular document are called Identifiers. Catalogued information is also addressable by the last name of any author associated with it. WISE-ONE is written to search for documents catalogued under any of the these indices and will yield the ERIC Accession Number, Author and Title associated with the selected documents. In the case of journal files, the journal name, volume and page are also displayed.

The following sections of this documentation give instructions in 1) accessing the computer center with a teletype or similar remote terminal device, 2) operating the WISE-ONE System, 3) building search strategies using the ERIC descriptors and WISE-ONE command words, and 4) creating batch runs for the generation of search abstracts.

Log In

To log into the 1110 system using a teletype, it is necessary to do the following:

1. Dial (608) 263-1108. (3-1108 on the Madison campus).[3] When phone rings, place it into the acoustic coupler. If there is a busy signal, wait and dial again.

---

[2] Thesaurus of ERIC Descriptors. CCM Information Corp., 866 Third Avenue, New York, N.Y. 10022. 330 p., Price: Hardcover - $8.95, Softcover - $6.95. LC Catalog No. 78-130347.

[3] The 263-1108 telephone line operates at 110 baud (10 characters per second), standard teletype speed. A 300 baud (30 characters per second) line may be obtained by dialing (608) 263-1140.

2. Type in UWTTXX. If nothing happens, retype UWTTXX followed by a carriage return; if nothing happens, hang up and go back to Step 1.

   If the 1110 responds with

   NO RUN ACTIVE

   or

   MACC 31.14 TTY UWTTNN

   Enter the run card statement

   "@RUN ERIC, Project #, User #" followed by a carriage return

   The 1110 will respond with the message

   "PASSWORD PLEASE"

   Enter your Password.

   The 1110 will respond

   "CONTINUE"

   For a more complete description of interactive computing on the UNIVAC 1110 Computer, the reader is referred to 1110 Timesharing Guide.[4]

Operation of WISE-ONE

Once logged into the 1110, the user may invoke WISE-ONE by one of the following general statements: @WISE*ONE.WISE-ONE,(Options) RIE

@WISE*ONE.WISE-ONE,(Options) CIJE

The first requests the system to access the RIE document file. The second calls the CIJE journal file. It is not possible to search BOTH files simultaneously.

---

[4]Harris, Ed. 1110 Timesharing Guide. Madison, Wisconsin: Madison Academic Computing Center, 1974.

The (Options) portion of the statement allows the user to insert a number of control codes at the time the user initiates the WISE-ONE program.

The valid options are:

H - indicates a Hazeltine terminal in use, otherwise a teletype is assumed.

P - causes the search file to be permanently catalogued, otherwise the file will be destroyed at the end of the run. When the P option is used, subsequent runs do not require the tape to be loaded, but there is a file storage charge. The cost of bringing up a data base with no permanent storage is about $13.00. The cost of daily storage of each file is about $25.00. If one anticipates four or more users in a day, the P option is recommended.

Q - checks the 1110 system to see whether the files have been previously catalogued by a P option. If the files are not catalogued, a message is printed and loading of the system from the tape library does not proceed.

T - causes the search times for each phase of the search to be printed.

Example 1:

@WISE*ONE.WISE-ONE,HP CIJE

This is the correct statement to execute WISE-ONE on the journal files with the following options:

1. Operate from the Hazeltine terminal.
2. Catalog the file for the remainder of the day.

Example 2:

@WISE*ONE.WISE-ONE RIE

This is the correct statement to execute WISE-ONE from a teletype on the document file with no selected options. If the file has not already been catalogued, the file will be made available for the duration of the run only.

Example 3:

@WISE*ONE.WISE-ONE,Q RIE

This statement will execute WISE-ONE from a teletype on the RIE document file IF the file has already been catalogued with a P option.

Following log-in and execution of WISE-ONE, the system will respond with a heading and then will give the user the option[5] of defining the listing parameters. Three options are available to the user and each will require a YES or NO response indicating whether or not it is desired. The first question asked of the user is:

DO YOU WANT A LISTING ON THE PRINTER?

A YES response will cause a print file to be generated for later transmission to a printer. The actual printer to be used must be specified by the user at the completion of all searches in a given run.[6] A NO response to this question will result in no record of the search being transmitted to the printer. The second question asked of the user is:

DO YOU WANT A LISTING ON THE TERMINAL?

---

[5]A "NO" response to the option of listing parameters results in the default conditions: 1) no listing on printer, 2) listing on terminal, and 3) authors and document titles included.

[6]Consult the MACC Timesharing Guide for remote site printer codes. The MACC site printer is PR12.

A YES response to this question will cause identified document or journal references to be printed on the terminal being used for the search. A NO response will cause no listing to be generated at the terminal.

DO YOU WANT THE ADDITIONAL INFORMATION?

This last question requests that the user indicate whether or not he desires the Titles and Authors to be printed on the printer and/or terminal (as specified above) along with the ERIC accession numbers (ED or EJ numbers). A response of YES will result in the Title and Author information being printed, while a NO response will suppress the printing of this information.

The three list parameters may be redefined at any point in the program by entering the command LISTP. This command calls in the sequence of listing options just described. The user is cautioned to request only a limited amount of printing on the terminal, as these devices operate at fairly low speeds and will require considerable time to print the results of a search which produced even a moderate number of references.

After the listing options have been given, WISE-ONE will then decide if it is necessary to load the search file from tape (note that the Q option will cause the run to terminate if the file is not already catalogued). If necessary, the system will print a message and there will be a five-minute delay while the tape is loaded. When the system is ready, it will print the following message:

ERIC DATA BASE CREATED DDYYMM (Day, Year and Month file
PROCEED was created)

Immediately following the PROCEED statement, the system may be used in two ways. The user may conduct his search in an alternating two-step manner or in a continuous string manner. The two-step approach may be

thought of as alternating between a SEARCH PHASE and an ACTION PHASE. The SEARCH PHASE - the identification of desired ERIC documents according to descriptors or identifiers - is followed by an ACTION PHASE in which the user may specify what, if any, action should be taken with respect to the identified documents. Each of these phases will be discussed in turn. For clarity, the system commands introduced in the following sections are presented in the SEARCH PHASE AND ACTION PHASE order. However, the system allows one to enter all commands in any order suitable to the searcher's individual needs and style. Logically inconsistent commands elicit polite but firm messages from the system directing the searcher to enter an appropriate response.

Search Phase Commands and Logic

The WISE-ONE system employs Boolean algebraic functions to process information search strategies. Command words controlling the functions are AND, OR, and NAND.

The results of these commands can best be illustrated with a short explanation of basic set theory which is analogous to the way the computer processes search terms. If we enter the term CHEMISTRY: (computer response-lower case; user response-upper case)

```
        proceed
→ CHEMISTRY
        250 documents in data base
        250 documents in search queue at level 0
→ END
```

a set would be constructed of all reports that have CHEMISTRY as a key word.

The computer responses gives the number of items retrieved for the term and begins to accumulate results in a holding area called the search queue.

If we add to the logic as follows:

proceed

→ CHEMISTRY

250 documents in data base

250 documents in search queue at level ∅

→ AND

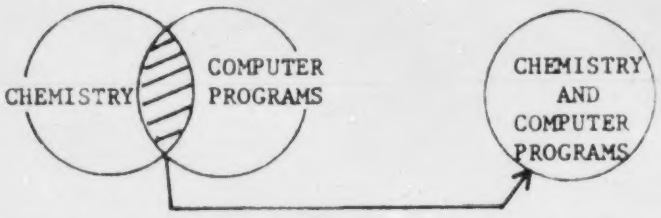
→ COMPUTER PROGRAMS

387 documents in data base

15 documents in search queue at level ∅

→ END

the set for CHEMISTRY would be constructed as before and a second set constructed of items which have COMPUTER PROGRAMS as a key word. The intersection of these two sets is the final result of the logic processing, and each of the items in this set has both CHEMISTRY and COMPUTER PROGRAMS as key words.

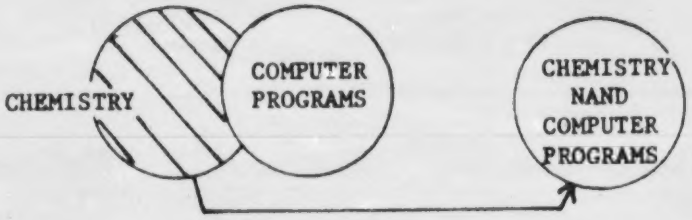


The result of the intersection is contained in the search queue following the last term.

If we change our logic as follows: (computer responses are deleted for clarity).

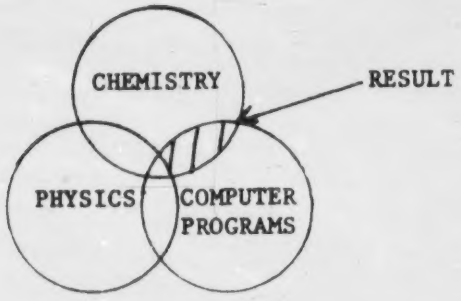
```
proceed
CHEMISTRY
NAND
COMPUTER PROGRAMS
END
```

we have taken the set, CHEMISTRY, and deleted from it the intersection with COMPUTER PROGRAMS.



Using both the AND and NAND functions together we could write the following logic.

```
proceed
CHEMISTRY
AND
COMPUTER PROGRAMS
NAND
PHYSICS
END
```



We have taken the intersection of CHEMISTRY and COMPUTER PROGRAMS and deleted from it the intersection with the set of report numbers that have PHYSICS as a key word.

To this point we have dealt with single terms separated by command words. It is often necessary to select related terms from the Thesaurus of ERIC Descriptors and combine their search results into a group for further logic manipulations. Using the example of CHEMISTRY, we may wish to add the search term CHEMICAL REACTIONS to the set CHEMISTRY: This is accomplished with the OR command:

proceed

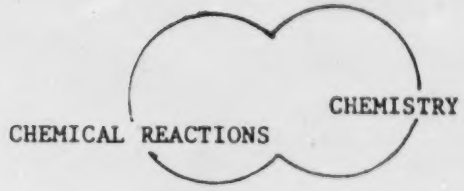
CHEMISTRY

OR

CHEMICAL REACTIONS

END

producing a new set which contains either the term CHEMISTRY or CHEMICAL REACTIONS.



The function of combining related terms can be extended to any number desired so long as each term is followed by the OR operator.

By analogy, we may wish to extend the second concept in the sample, COMPUTER PROGRAMS. NOTE: The auxiliary commands of OPEN and CLOSE are required for this operation and fit into the sample logic as follows:

proceed

CHEMISTRY

AND

OPEN

COMPUTER PROGRAMS

OR

COMPUTERS

CLOSE

END

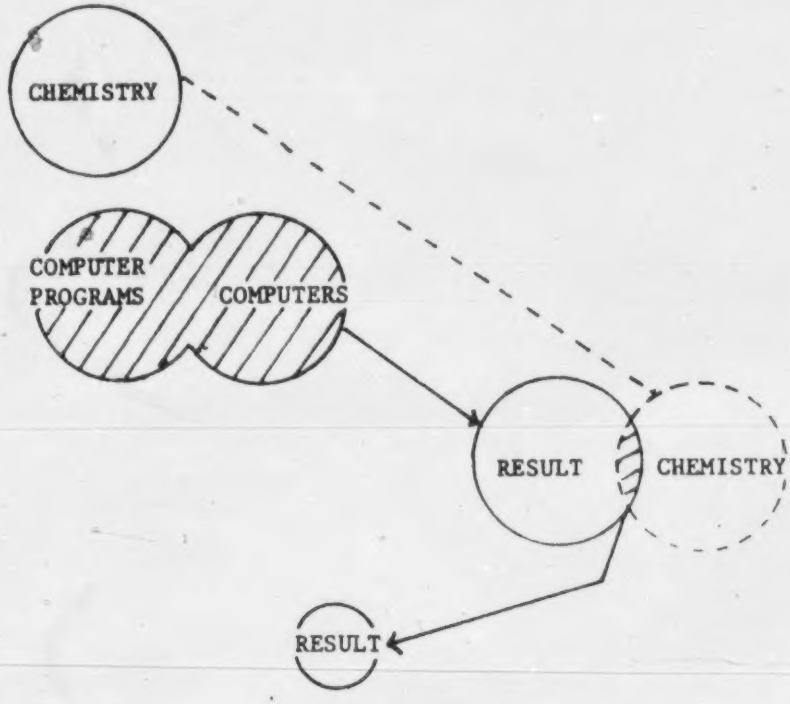
The OPEN command has the effect of isolating the first set CHEMISTRY while the set COMPUTER PROGRAMS or COMPUTERS is accumulated. The command CLOSE resolves the preceding combination of sets. In effect, the OPEN and CLOSE commands are equivalent to parentheses. The term for such an enclosed set is "nested" set. Using diagrams:

STEP 1

STEP 2, 3

STEP 4

RESULT



The search command END has been included in the examples without comment to this point. This command signals the end of the current SEARCH PHASE and causes the computer to list the total search time required for the current SEARCH PHASE.

The SAVE command may be used to temporarily preserve search strategies or portions of search strategies. Such saved strategies may be called later in the run and combined with other descriptor terms to form new strategies or to run the same strategy on a new file. The user may enter the SAVE command at any time during the SEARCH or ACTION phases. Entering SAVE during the SEARCH phase stores all descriptor terms and logical operators entered prior to the SAVE. It is not possible to SAVE a strategy which contains a former SAVE statement.

The ADD command is required to recall a search strategy which has been previously stored by a SAVE command. The ADD command must be used during the SEARCH phase of the program. NOTE: The SAVE and ADD commands allow the user to preserve the search strategy in two forms. If the FORMULA option is used, all of the preceding descriptors and logical operators are saved. If the QUEUE option is used, the contents of the last QUEUE preceding the SAVE command are preserved. Example 1.

The user wishes to SAVE the following strategy:

```
COMPUTER ASSISTED INSTRUCTION
OR
COMPUTER ORIENTED PROGRAMS
OR
CAI
SAVE
```

(the computer response is)

```
queue or formula?
```

→ FORMULA (or F)

what is the element name?

-> CAI (the user assigns his own label up to twelve characters)

search formula CAI saved.

Example 2.

The user wishes to recall the formula.

NEXT REQUEST PLEASE

→ ADD

queue or formula?

→ FORMULA

What is the element name?

→ CAI

search formula CAI added.

(the program will begin to search the terms in the SAVE strategy automatically)

Example 3.

The user wishes to SAVE the search QUEUE for the preceding strategy.

→ SAVE

queue or formula?

→ QUEUE (or Q)

what is the element name?

→ QCAI (a unique label should be assigned)

search queue QCAI saved.

(the user may then recall the queue in the same fashion as the formula in Example 2.)

Summary of SEARCH PHASE Commands

The left arrow prompts the user to enter a descriptor, identifier or author. A summary of search results to that point is then listed. The user may then enter a search operator to expand or limit the search.

AND — The system will include in the search queue only those references which intersect with the next identifier. The search queue will contain only those listings shared by the key words both preceding and following the operator.

OR — The system will add to the present search queue all references to the descriptor which follows the OR.

NAND — The system will exclude from the search queue all references which intersect. This operation is equivalent to a "BUT NOT" logic.

OPEN — Opens a parenthetic expression and allows the user to nest his searches.

CLOSE — Used in conjunction with OPEN to close a parenthetic expression.

END — Stops SEARCH PHASE and enters action mode.

SAVE — Preserves a search queue or formula for later recall.

ADD Allows the user to add a search queue or formula that has been saved.

ACTION PHASE Commands

List Control Commands

1. LISTP Allows the user to redefine the listing parameters.

Example: The user has retrieved 99 documents, wants to review them at leisure and hasn't time to print all 99 on the teletype. (Arrow precedes the user's response)

ACTION 1 LISTP

Do you want a listing on the printer?

→YES

Do you want a listing at the terminal?

→NO

Do you want the additional information?

→YES

2. LIST List the contents of the search given in accordance with the listing parameters.

Example: The user has completed his search and wishes to print the references in accord with the options specified by the LISTP command.

ACTION →LIST

After the final title has listed the computer will return the message:

ACTION

→

3. *LIMIT — Allows the user to place an upper limit on the number of citations to be printed; initially the value is 2000.

Example: The user has retrieved 50 documents and wants to examine the five most recent.

```
ACTION    →*LIMIT
   Limit was 2000 is now      5
      →LIST
```

4. *LOW and *HIGH — Allows the user to partition the file by document serial number.

Example 1: The user wishes to see only those documents which have an accession number greater than 30000.

```
ACTION    → *LOW
   Low limit was 0 is now      30000
      → LIST
```

Example 2: The user wants to see results between document numbers 30000 and 50000

```
ACTION    → *LOW
   Low limit was Ø is now      30000
      → *HIGH
   High limit was 100000 is now      50000
      → LIST
```

NOTE: Commas are not used to separate numerals in the above commands. Enter numerals only.

Example 3: The user has listed the five most recent documents and wishes to see the next 5.

ACTION → *HIGH

High limit was 100000 is now (enter number of last document displayed minus one. No commas!)

5. *BEFORE and *AFTER

These commands permit selection of documents which meet a desired limit of publishing date. The publishing date appears on the title listing as the last two digits of the year, i.e., 69, 69, 70. If no publishing date appears on the master tape for an item, a ∅ zero appears in the date field.

Example 1: The user wishes to see only those documents which were published during or after 1971.

ACTION →*AFTER

After date was 0 is now 71

→LIST

Example 2: The user would like to view only those documents published from 1968 through 1970.

ACTION →*AFTER

After date was 0 is now 68

→*BEFORE

Before date was 0 is now 71

→

6. *LIMITS

This command gives a listing of all limit settings: LIMIT, HIGH, LOW, BEFORE, AFTER.

7. *RESET Resets all limits to their initial values.

8. SEARCH Terminates the action phase and returns the message:

NEXT REQUEST PLEASE

A simple carriage return after the prompt, ACTION, will accomplish the same thing.

9. ABSTRACT The ABSTRACT command initiates a routine for creating copies of whole ERIC abstracts. Due to the volume of material involved in complete abstracts, it is not feasible to display them in the on-line mode. Rather, the system prepares the results of the on-line search for input to a batch run on the complete ERIC master tapes. Typing ABSTRACT produces the following responses.

DO YOU WANT TO BATCH THE OUTPUT?

YES - The search result is saved for printing at a later time. NOTE: This later printing may be run overnight at substantially lower rates.

NO - The system will start a special run that prints the abstracts immediately.

If YES the system responds.

WHAT IS THE NAME OF THE BATCH FILE?

The user must enter a name which will distinguish his output from others in the system, for example:

ERIC*FILE

The following responses fill in cover information and are entirely optional.

WHAT IS THE TITLE OF THE SEARCH?

(User's Choice)

WHAT IS THE SEARCH I.D. NUMBER?

(Optional - for those who wish to use their own number system. Limit, 6 digits).

ENTER YOUR NAME AND ADDRESS ON THE NEXT FIVE LINES. IF YOU DO NOT NEED A LINE ENTER A BLANK (All entries are optional).

DO YOU WANT A COVER PAGE ON YOUR OUTPUT?

(The user can request a formatted cover page with title, number, name, and address information previously entered).

DO YOU WANT THE ABSTRACT USERS GUIDE?

- (Approximately three pages of general information can be printed out at the user's option. Information on the divisions of the abstract, directions for ordering whole documents and listing of ERIC clearing houses is included.)

Following the ABSTRACT routine, the system prints out the message,

XX DOCUMENTS TO BE ABSTRACTED

to confirm the number of documents to be printed. If the user has requested an immediate printout the system prints a run number message,

STARTED RUN IS XXXXX

for reference when picking up the printout at the computer center.

10. QUIT — This command causes the termination of the WISE*ONE program and returns the user Execution of Abstracts to 1110 system control. Following this command the user may reexecute the WISE*ONE program with different file.

11. @FIN — This command must be entered if the user wishes to end his run on the terminal.

Creating A Batch Run For Abstracts

The previous section describes the procedure for setting aside the results of a search for printing of whole abstracts at a later time. When the user is asked to supply a name for the batch file, (the example ERIC*FILE was used), the system stores the appropriate reference numbers and any optional name and address information specified under the batch file name. When the batch run is created, document reference numbers are matched to the master tapes and selected numbers printed.

While many users will make a single search, file the results for an abstract run, and print the abstracts, the system allows one to store as many searches as desired under the same batch file name. Printed abstracts are then grouped as originally searched and only a single abstract run is required to print all searches.

The control cards required to print abstracts are:

@RUN,/ER name,proj.#,user#,$nn.nn,page limit

@ADD WISE*ONE.WISE-ONE

@ADD batch file name.

@FIN

The first card initiates the run and identifies the user's job to the 1110 system. The dollar limit is a safety feature which prevents the run from overrumning the user's cost expectations at the same time giving the run enough resources to finish. Allow 10¢ for each abstract to be printed. (Multiply number of abstracts by $.10.) The page limit is also a safety feature and should be about equal to the number of abstracts to be printed. The second card, @ADD WISE*ONE.WISE-ONE, must be entered just as shown. The third card, @ADD batch file name, requires that the user supply the identical name assigned earlier to batch to be printed. The fourth card is the final card in the deck and signals the end of the job to the system.

To execute a batch run at the Madison Academic Computing Center:

1. Go to room B119 of the Madison Academic Computing Center, 1210 W. Dayton Street to punch the required cards using the keypunch machines available.
2. Submit the cards to the I/O clerk at the window. Ask that the job be run DEFFERED if you wish to have the abstracts printed overnight.
3. Return the next day, present the receipt card to the clerk to receive the abstract printout.

NOTE: If you desire to print abstracts, submit the run the same day you complete your search(es), as the batch file will be automatically destroyed the next morning.

APPENDIX H

USER
REQUEST FORM

Date _____ Sequence # _____

Person Requesting Information _____

Title _____

Address _____ Phone _____

Is this your first request? ___Yes ___No

What is the title or major subject area of your request? _____

Which of the following levels (if any) apply to your topic? (Check all that apply)

___Primary
___Intermediate
___Elementary
___Secondary
___Junior College
___Graduate
___Higher Education
___Adult
___Professional
___No Level
___Other (specify)
_____

What is the general purpose of your information search?

___Proposal Development
___Project Operation
___Curriculum Development
___Administrative Management
___Instructional Improvement
___Thesis/Dissertation
___Course Review of Literature
___Inservice Training
___School/Community Relations
___Other (specify)
_____

What type of materials are you most interested in?
(instructional materials, reports, etc.)

How many references do you expect or prefer?

___Up to 10 ___Up to 25 ___Up to 50 ___Up to 75 ___Over 75

Please write a detailed statement describing your specific information needs in your own words, considering the information indicated by your choice as checked. Be specific as possible. Use additional sheets if necessary.

If possible, list authors' names, project/program titles, ERIC abstracts (ED numbers), descriptive terms, and any other pertinent information which may be helpful search keys to the retrieval staff.

Type of output desired: ___ID numbers only ___Citations ___Abstracts

APPENDIX I

Sequence # _____

SEARCH WORKUP FORM

Concent 1. _____

Concent 2. _____

Concent 3. _____

	And;Or		And;Or
Descriptors (1)		Descriptors (2)	Descriptors (3)

Comment:

APPENDIX J

Sequence # _____
User # _____

Computer Run Report
Project #

Run ID _____ Time _____ Date _____

Work Description	number of citations found RIE	CIJE	AIM/ARM	Comments

run cost $ _____

Output Received: _____ (date) Citations ☐ Abstracts ☐

Follow up by phone within a week of search completion:

Did the search results meet your needs and specifications? _____

Was there a benefit to your project due to using the computer search?

☐ large amount ☐ small amount ☐ none ☐ loss

How many of the citations found were relevant to your project? _____

Comments:

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Deats, Tom. "Moving and Using Information." Teachers College Record 75(3), 383-393. (Fe 1974). If one wishes to be able to decide whether information will be accepted by educators, or, as Deats puts it, to see "whether the natives are friendly," he ought to study the language presented here so that he is no stranger to this exotic land (witness the title).

Ely, Donald P. "The Myths of Information Needs." Educational Researcher 2(4), 15-17. (Ap 1973). Information, Ely feels, may serve as an organizer in our thinking about education and man. But, in order to put it together usefully for an organizing influence, some misconceptions should first be considered. Herein are five such misconceptions, analyzed and articulately so.

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Havelock, Ronald G. *A Comparative Study of the Literature on the Dissemination and Utilization of Scientific Knowledge*. Ann Arbor, Michigan: Michigan University, Center for Research on Utilization of Scientific Knowledge. (Jy 1969). This 507 page report scarcely needs introduction to designers or operators of information systems who take seriously their achievements. In addition to models of dissemination and utilization, the "linkage" notion is here initially expressed, and several factors requisite to successful dissemination and utilization are proposed.

Kernan, Jerome and Richard Mojena. "Information Utilization and Personality." Journal of Communication 23: 315-327. (Se 1973). The notion of channel capacity is related here to other work. The authors have conducted a study of information needs as they are perceived in relation to quantity available and proportion used, and this is the report of that study. Given audience (information users) similarity to the experimental groupings, one might make use of the findings for designing information systems.

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Mumford, Lewis. The Pentagon of Power. New York: Harcourt Brace Jovanovich, Inc. 1970. The second volume of a series entitled The Myth of the Machine to which the first volume addressed Technics and Human Development, this is *de riguer* for those wanting to enlarge the circle of their reading from Gilbert Ryle, Noam Chomsky, J. B. S. Haldane, and many others like those mentioned in the note on Williams below. His list of contributions to the warnings of *trop* technology are but the first commendation we would extend, and we could go on at unfortunate length to present what we believe to be a messianic message to mankind from this historically structured man.

McNelly, John T. "Mass Media and Information Redistribution." The Journal of Environmental Education 5(1), 31-36. (Fall 1973). A strong position on the side of the receiver-oriented delivery system, McNelly draws out cognitive consistency theory, in which he says the core assumption "is that people try to maintain...interconnectedness among their beliefs, that they try to make sense out of their world by maintaining some degree of internal harmony among their beliefs." We stand on the same side of the line, but take the persuasive approach he condemns in getting the readers who have progressed this far to add his article to their readings.

Robinson, Erika L. *An Analysis of the Impact of the Research Utilization Project on Principals' Attitudes and on the Use of Information Services by Teachers and Other Field Personnel in 16 Target Elementary Schools of the District of Columbia.* Washington, D.C.: District of Columbia Public Schools, Department of Research and Evaluation. (Ag 1973). Important for a discussion of a study to carry research information into the field where it may be applied, this is another paper advocate of the extension agent model for information dissemination.

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Shubik, Martin. "Information, Rationality, and Free Choice in a Future Democratic Society." Daedalus 96(3), 771-778. (Summer 1967). A particularly straightforward account for those who plan for the future. A quote from the article always seems appropriate, and particularly as a summary of its vast scope: "The aggregation of individual wants and powers into social wants and powers is one of the central problems of political science, economics, and sociology...We are currently in the position... to ask if it is at least logically possible to discover methods for making diverse aims of a society consistent."

Stern, Louis W. et al. "Promotion of Information Services: An Evaluation of Alternative Approaches." Journal of the American Society for Information Science (24(3), 171-179. (My/Je 1973). A study completed to assess the usefulness of various methods of seeing "how friendly the natives actually are" (see note on Deats above). When all else fails (if it does), we heartily recommend the linesman's attack which Stern sternly advocates, appropriately called the "blitz."

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Toffler, Alvin. Future Shock. New York: Random House, (July 1970). A journalistic masterwork for all futurist planners, this is a newsman's dream but not very much an academic enterprise. Toffler has an essential message which he champions with great fervor, and in true journalistic fashion one is never sure where the author's position lies amidst objective reporting. Yet he supports his thesis with quasi-academic employment of a multitude of sources, and if the reader can wait until the last third of the book to find the author's personal statement he will be rewarded with a powerhouse of cocktail party conversation.

Williams, Kenneth R. "Reflections on a Human Science of Communication." Journal of Communication 23: 240-241. (Se 1973). Williams recommends we advance a linguistic dimension for the term "communication" in order to give it a complement to substance which will appoint more human claims to the science of communicating. This presents an interesting parallel of the "mind and machine" debate seen in Mentality and Machines by Keith Gunderson, Minds and Machines by Alan Ross Anderson, and others like Gilbert Ryle's The Concept of Mind.

CENTER FOR STUDIES IN VOCATIONAL AND TECHNICAL EDUCATION, UNIVERSITY OF WISCONSIN-MADISON

The Center for Studies in Vocational and Technical Education at the University of Wisconsin-Madison was reorganized with the support of the Wisconsin Board of Vocational, Technical and Adult Education within the School of Education in 1971. The function of the Center is to serve the State of Wisconsin in a unique way by bringing the resources of the University to bear on identified problems in the delivery of vocational and manpower programs—vocational education, technical education, adult education, career education, manpower training—to citizens of all ages in all communities of the State. The Center focuses upon the delivery of services including analyses of need, target groups served, institutional organization, instructional and curriculum methodology and content, labor market needs, manpower policy, and other appropriate factors. To the extent that these goals are enhanced and the foci of problems widened to encompass regional and national concerns, the Center engages in studies beyond the boundaries of the State.

Merle Strong, Director
Roger Lambert, Associate Director